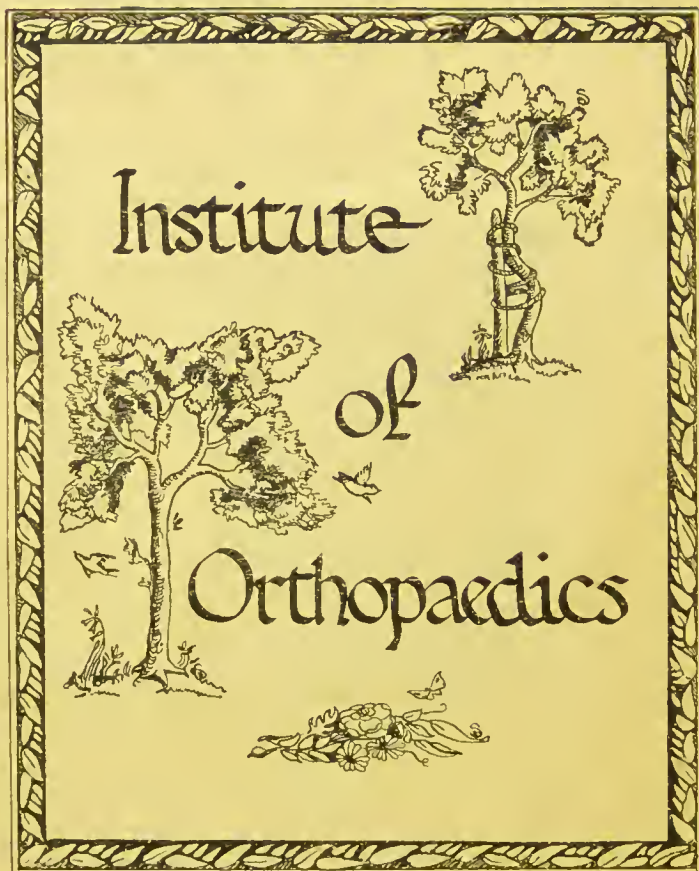


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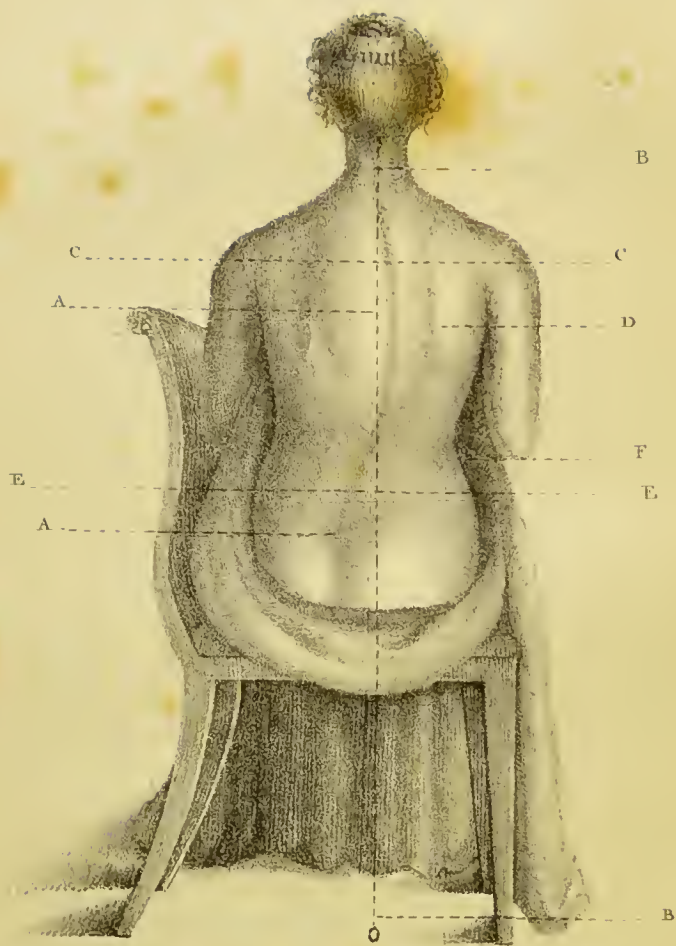
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James Reid Esq. M.D.
with kind regards of
the Author

AN INQUIRY
INTO
THE NATURE AND CAUSES
OF
LATERAL DEFORMITY
OF THE
SPINE.

W. WILSON, PRINTER, 57, SKINNER-STREET, LONDON.





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ILLUSTRATION OF DOUBLE CURVATURE OF THE SPINE. See Sect. I. P. 4

*AA. Dorsal & Lumbar Curvatures
of the Spinal Column.*

*BB. Plumb line dropped from the centre
of the occiput, indicating the extent
of deviation in the Spine from
the true perpendicular.*

CC. A line drawn at right angles to

*BB. indicating the elevated state of
the right shoulder.*

*D. Unnaturally projecting blade-bone
of the right side.*

*E.E. Line indicating the inequality
produced in the size of the hips.*

F. Falling in of the right flank.

AN INQUIRY
INTO
THE NATURE AND CAUSES
OF
LATERAL DEFORMITY
OF THE
SPINE;

IN REFERENCE, MORE ESPECIALLY, TO THE PERNICIOUS EFFECTS OF
CERTAIN MORAL AND PHYSICAL INFLUENCES, RESULTING
FROM THE MODERN SYSTEM OF

FEMALE EDUCATION:

WITH

PRACTICAL HINTS FOR THE PREVENTION AND CURE
OF THIS AFFECTION.

BY

EDWARD W. DUFFIN, M.D.

FELLOW OF THE ROYAL COLLEGES OF SURGEONS OF LONDON AND EDINBURGH;
FORMERLY ONE OF THE SURGEONS OF THE ROYAL DISPENSARY, AND OF THAT
FOR THE TREATMENT OF DISEASES OF THE SKIN, EDINBURGH, ETC.

“Le mode di vestire sono sì bizarre, che nascono spesso et deformano la natura, fin a
pervertirla da non riconoscerla più.” MILIZIA.

SECOND EDITION,

CAREFULLY REVISED, AND ILLUSTRATED BY SEVERAL LITHOGRAPHS.

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PREFACE.

A FEW years ago, the substance of the following remarks was published under a somewhat different title to the one at present assumed ; and the reception it met with amongst the Author's friends, as well as a successful sale of that edition, have induced him to republish the same. Considerable practical experience having, since that time, enabled him to correct or confirm such opinions as he then ventured to promulgate, he trusts the present revised exposition will be as favourably received.

Although, strictly speaking, the nature and treatment of deformity of the spine, and its various modifications, is a subject that cannot be completely understood, in all its bearings, by the non-professional reader, yet there is much that relates to the causes and prevention of one variety, denominated *Lateral Curvature*, that comes perfectly within the scope of every scientific inquirer, and more especially of such as are engaged in the tuition, or

superintendence of youth. Nor can it, inas-much as it involves one of the dearest and most important interests of society, fail to prove a subject worthy the consideration of every liberal and well-constituted mind.

But surely at the present day, when civilization has arrived at so high a state, and mankind in general possess so much of the information formerly confined to a few, no apology is required for an attempt, the object of which is the physical improvement, health, comfort, and happiness, of a very large portion of our fellow-creatures.

The observations contained in the following pages, from the size of the volume, it need hardly be observed, are of a very general nature,—a mere outline of the subject,—designed to excite in those more immediately concerned, a closer and more scientific inquiry ;—and in parents and guardians, a determination to oppose the practical application of the sources from whence the evil is derived.

Under these circumstances, the anatomical and physiological details have been rendered as short, and devoid of technicality, as is consistent with a scientific explanation of the subject, and embrace nothing that may not

be easily comprehended by the well-informed general reader. For professional men, even these, it is presumed, are unnecessary.

The Author, be it understood, by no means arrogates to himself the merit of originality, though in most particulars his observations have been confirmed by individual inquiry and experience. But he is not aware that any essay, calculated to afford a condensed, popular, and, at the same time, scientific explanation of such parts of the subject as he has selected, is at present in the hands of the public.

In his former remarks he was accused of unnecessary severity, in his strictures on the conduct of governesses and superintendents of female seminaries. The Author takes the present opportunity, therefore, of disclaiming all intention of giving offence, or of wounding the feelings of any one ; more especially of a class of individuals for whom he entertains the highest sentiments of respect.

AN INQUIRY,

&c. &c.

AMONG the various influences to which the human race is exposed, there is perhaps none from whence arises, at the same time, a greater amount of two extremes—of *good* and *evil*,—than that on which man most prides himself,—his *high state of refinement and civilization*. From this proceed, consentaneously, his greatest happiness, and his utmost misery ; his supreme glory, and his direst curse.

When we take a retrospect of the ages of barbarism and ignorance that are past, we find that the catalogue of diseases, of human misery, and anxieties, bears no proportion to that of modern times ; and were we to include savage life in the calculation, or rather limit our inquiry to this condition of man, the amount would scarcely equal a tithe of that which obtains even in the intermediate state. To luxury, civilization, and morbid exaltation of feeling, which is their concomitant, and the result of refined education, we are alike indebted for these, and the most varied and delicate enjoyments of which mankind are susceptible.

Nor is this effect of civilization limited to the

human species. No sooner do we subject the brute creation to our domestic habits, and civilize them by diet, tending, breeding, and training, than they too lose their native character,—put on all the delicacy, and become subject to, as well as the sport of, the morbid excitements of artificial life, and obnoxious to numerous and complicated diseases: so that, however much we might deplore any retrocession in luxurious refinement, or desire to promote the progress of knowledge to its utmost boundaries, we cannot but lament that the apparently unavoidable attendants on advancement are calculated, if not to poison, at least to adulterate, the cup of our enjoyment.

But with all its attendant evils, great as they may be, where is even the cynic bold enough to deny that education is the greatest blessing man enjoys? It is a benefit capable of being conferred, in its fullest extent, upon him alone; in a more limited sense, upon all organic beings. To mould and train in a particular manner is its office; and as the young and tender plant is bent and twined in any direction, while recently ascending from the earth, so ought the mind of man to be trained by education;—a simile of which the elegant poet of “The Seasons” has apparently availed himself, in his trite but beautiful verses, in praise of the task of instruction:—

“ Delightful task to *rear* the *tender* thought,
And teach the young idea how to *shoot*, &c.”

It would have been well for mankind had this analogy between the vegetable and animal kingdom always been kept steadily in view, and fairly pursued. But it has unfortunately happened that while, by all sorts of means, the mind of man, instead of being moulded, reared, or trained, has been forced to assume the ductility of the vegetable, the immortal springs of action that lurk within him—his instincts and his passions—have too often been entirely forgotten. As regards his physical frame, a no less pernicious error prevails, the result of similar oversight, or wilful neglect. The one, indeed, is inseparably connected with the other; or is, at least, its natural consequence. Whilst eagerly engaged in modelling the energies of the soul, the instructors of youth seem, to a certain extent, to forget, or never to take into due consideration, that man has also a body to be cared for, on whose integrity and vigour the powers of the mind, in many instances, mainly depend; and by an unskilful management of which, not only disease is generated, and deformity produced, but life itself may be sacrificed.

It is to this neglect of the physical powers, more especially as regards its influence on the animal organization, and development of form in young females of a certain rank in society, that we propose in the following inquiry to direct attention.

SECTION I.

The frequent occurrence of Deformity of the Spine and Chest constitutes, perhaps, one of the most common results of the physical debility induced by the system we are here deprecating. There are few mothers who are not familiar with one of the first characteristics of this affection, — a *projecting, high, and distorted* shoulder.

The child, arrived at her tenth or twelfth year, perhaps at an earlier period of her life, has spent a twelvemonth or more at school, or been placed under the surveillance of a governess residing in the family, whose sedulous and praise-worthy attention to the mental improvement, as well as to the personal appearance and carriage of her pupil, is remarkable: yet, in spite of every exertion on her part, it is observed that her charge is becoming crooked. Her right shoulder projects more, and is higher than natural, and is, in common parlance, said to be “*growing out.*” On a more careful examination, it is found that the central groove of the back deviates from a straight line; that there is a greater distance between a given point of the original perpendicular *spinal* line and the top of the elevated shoulder bone, than between the same point and the corresponding top of the opposite side. As the deformity advances, the gait of the young person becomes awkward and shuffling; her

clothes cannot be made to fit well upon her ; they appear to be drawn to one side, generally the right. The sash encircling her waist is observed to dip in the same direction, while the right breast presents a more than ordinary fulness*, and the corresponding collar-bone displays a proportionate elevation. In short, the child is deformed. Her back-bone is distorted ; and, in a multitude of instances, even in this early and remediable stage, absolute and permanent distortion can be prevented only by care and attention of no common kind, directed upon principles derived from a thorough knowledge of the nature of the parts affected.

In proportion as the inclination takes place in the upper part of the back, between the shoulders, nature, in order to counterbalance the evil, and preserve the equilibrium of the body, calls into action the muscles of the lower part of the spine on the opposite side ; so that, in confirmed cases, a *double* curvature is produced.

As the infirmity advances, a similar counterpoising power is exerted by the muscles of the spine attached to the vertebræ of the *neck*, and a *third* or upper curve is then formed, so that the spine presents a serpentine appearance, inclining to each

* “ When the deformity is not noticed till about the fifteenth year, the state of the breasts most frequently first attracts attention, one appearing larger than the other, and growing so unequally as to lead to a suspicion that it is diseased.”

Shaw on Deformity.

side alternately, as exemplified in the lithograph facing the title page.

The ribs, in consequence of the alteration in the course of the spine, aided by a continuance of the same debilitating causes, soon partake of the extending change that is going on, and deviating from their true direction, contract and deform the chest; so as not, improbably, in many instances, to lay the ground-work of consumption, or excite this insidious and destructive disease into activity, when, from other causes, there exists a tendency to organic disorder of the lungs*.

* Occasionally, however, deformity of the bones of the chest may proceed to a very considerable extent, and affect the functions of the lungs in a remarkable degree, without inducing *organic* disease. Of this I had a very striking instance under my care, about four years ago. The young lady came from Wales to be under my direction. In her case the evidences of consumption were so strongly marked, as completely to mislead myself, as well as one of the most eminent practitioners of this metropolis, called into consultation. It was our united opinion that she could not survive six weeks, and we recommended her parents to take her back to the country. She, however, was left in charge of some very kind friends, and consigned to my care. I am happy to have it in my power to add, that not only every symptom of consumption vanished, but by great care and attention, she so far recovered her shape and form, that at the expiration of two years and a half, those who had known her could scarcely at first sight recognize her. She acquired an addition to her stature of several inches; and from being an object calculated to excite the sympathy and attention of every one, she became so straight that by a little soft padding, judiciously disposed in her dress, she could walk the streets, and appear in society, without attracting particular notice.

Finally, the basis, or pelvis, on which the spine rests, becoming involved, produces an inequality in the size of the hips, the contrary of that which obtains in the shoulder, and causes the body, when viewed from behind, to appear as if twisted on itself.

When deformity of the kind we have been describing is ascertained, though only in a slight degree, to be really established, let it not be argued that the girl will “outgrow it:” *she never will*. This, though a common, is a very erroneous notion, and fraught, in many instances, with the most pernicious consequences. The parent who rests his hopes on so fallacious a foundation, will invariably be disappointed. The longer the deformity exists, unless the causes from whence it proceeds be discontinued, the more conspicuous it is sure to become. When established to any considerable extent, artificial means, however well applied, aided by the best devices of the milliner, the usual resource, fail in concealing it. During childhood, backboards, steel stays, constrained positions of the body, concealed pressure*, and similar expedients, are resorted to, with a view to *force in*, or *bind down*, the high and projecting shoulder, erroneously supposed to be alone in fault. This treatment, it need hardly be observed, is almost invariably productive of an aggravation of the mischief it is designed to remedy, as well as injurious to the form of the chest; for it

* It is customary to bind over the projecting shoulder-blade a plate of lead, which is concealed under the dress.

is only at the expense of the just configuration of this important part of the frame, that such means can exert even an apparent influence in remedying the evil. The real origin and nature of the mischief, not being suspected, a judicious mode of effecting its removal is scarcely ever employed. At a later period of life, mechanical means, being found ineffectual in restraining the progress of the affection, are abandoned. Such distortions are observed to be by no means uncommon ; and like other evils of frequent occurrence, are supposed to be irremediable, and considered of comparatively small importance ; particularly as they neither incapacitate the person for the fulfilment of the ordinary duties of life, nor appear to affect the probable duration of existence. Artifices of dress being now substituted for mechanical contrivances, the manipulations of the waiting-maid supply the place of well-directed medical and surgical skill ; or, in more pointed cases, the machinist is resorted to, who not unfrequently increases the deformity he undertakes to cure.

Such, then, is a general outline of the indications by which *lateral* curvature of the spinal column may be recognised. It is an affection by no means limited to the present day, as many would have us to suppose. Pinæus, who flourished towards the close of the sixteenth century, asserts, (so common was it at that period) “ that of fifty females of the higher or more civilized ranks of society, scarcely

two could be found who had not the right shoulder higher, and more projecting, than the left," — an assertion, which, but slightly modified, may with considerable truth be applied to young women of a corresponding class in modern times.

SECTION II.

We are next led to inquire into the *Causes* of this affection.

For the sake of perspicuity, these might be divided into *moral*, *physical*, and *constitutional*; but they so act and re-act on each other, that to follow implicitly an arbitrary division would be next to impossible.

Although generally, and with much truth, as may have already appeared, attributed to a faulty system of physical discipline pursued in early life, yet this deformity is by no means to be ascribed exclusively to the operation of this cause, nor to be considered as limited in its existence to the more wealthy and civilized portion of the community. It occurs in numerous instances amongst individuals in humble life — artisans and manufacturers, miners, labourers, &c.; but, in such cases, it is intimately connected with the nature of their daily avocations; and where these have no tendency to produce constitutional debility, it seldom proceeds beyond a limited extent, and is unproductive of those serious consequences

that indicate its progress in the cases we are more immediately considering.

The analogy, however, between the operation of the causes tending to produce deformity among factory children, and of those that produce their influence on the delicately educated female, is much more striking than at first sight may appear, and more than justifies the humane interference lately made by Government in behalf of this numerous and ill-used class of the community. The physical or mechanical cause—their employment,—may be different; but its *modus operandi*, as regards the influence produced on the constitution, and the results thereof, is in many respects precisely the same. Unfortunately, the ignorance of the multitude, and the occasional unguarded and highly reprehensible observations of medical men, have concurred in ascribing all physical infirmities to the influence of certain hereditary constitutional maladies, the very names of which are never heard without abhorrence,—a circumstance, in the present instance, particularly to be regretted, as the prevalence of such a feeling often prevents the sensitive from exposing, even to their dearest friends, that which they have erroneously been led to consider as a stigma on their family or forefathers; and thus the wholesome counsel of the better informed, which might solace their morbid sensibility, and encourage them to resort to scientific aid, is either never sought for, or deferred till too late to prove of any service.

Doubtless, original debility of constitution, wherein there exists a more imperfect, soft, and yielding state of the bones, than is proper to the robust and healthy frame, materially facilitates the supervention, and contributes to confirm affections of this nature; and, it must be confessed, that in very many of the more aggravated cases that present themselves, the local deformity is intimately connected with an originally delicate and tardy evolution of the physical organization.

But hereditary predisposition is by no means indispensable: there are innumerable instances wherein the primary causes are indisputably the result of sedentary and other pernicious habits, insisted upon more especially during the period of life allotted to the acquisition of scholastic knowledge; and not a little augmented by the operation of certain artificial manners and arbitrary usages, which appertain to a somewhat later epoch. These, it is true, are to be attributed to the vitiated state of public taste, and the vain efforts of modern fashion to attain the very highest point of refinement. Still they exist, and do not operate the less forcibly, whatever plea may be urged in their extenuation.

There are, moreover, several other causes resulting from the present state of society, that produce a powerful influence on modern education, and tend materially to favour the formation of curved spine.

The first of these is the immense competition

that is to be met with in every line of employment, and in none more universally than in that which embraces the superintendence and instruction of youth.

Now admitting, what is very questionable, that all these competitors for public favour, if not capable of undertaking the practical part, are sufficiently acquainted with the principles of education to superintend the studies of youth, it does not follow that they are at all versed in those of *physical discipline*. In truth, comparatively few who undertake the early instruction of females know any thing of the principles of physical education ; there is a beaten course which, it may be said, they mechanically pursue, without ever once thinking of investigating its ultimate influence on the natural operations of the delicate and irritable parts which compose our system. Indeed, they are unacquainted with the method of instituting such inquiry. It is the province of the physiologist ;—all they can understand is the present apparent good. It is not by these remarks intended to censure teachers and superintendents for want of information in this respect ; because not only is the subject one of acknowledged difficulty to all those who have ever applied themselves to investigate it, but it is one that the general course of the preparatory studies of even those designedly educated for teachers does not lead them to inquire into.

Moreover, if there are, as in other professions, a

sufficient number of persons expressly trained for the office of instruction, it is clear that all irregular additions to the same will have the effect of producing an unusual degree of competition. Of this the immediate result must be, attempts to excel each other, and a laudable emulation to obtain the same common objects—public confidence, wealth, and consequence. This may give rise to a positive improvement in the art of teaching ; but it will be, in general, at the expense of the physical development of the pupil. Parents and guardians hear, and often in very exaggerated terms, of the progress made by the scholars of a particular establishment ; and naturally decide upon sending their own children where they may avail themselves of similar advantages.

But before entering his child at such an institution, the parent would do well to inquire how, and at what cost, the boasted superiority he has heard of is obtained ? Is it by adopting a really improved and more natural system of tuition, so that the memory is neither wearied nor disgusted ?—or is the succession of what is taught so methodically arranged that the scholar finds every where something that is *past*, with which she may connect the something *new* that follows ?—or are there arrangements made in these establishments to obviate the several causes which tend actually, though indirectly, to shorten the legitimate period of study ?—for such is the quantum of information necessary, in modern

times, to be acquired by a well-educated person within a limited period, that the portion of life, usually devoted to the attainment of elementary knowledge, is indirectly rendered insufficient for that purpose. Or, lastly, does the individual anywhere exist, so well acquainted with the powers of the understanding, and the passions of the heart, as to be able through them, to wield at will, to excite or fix at pleasure, the attention of the human mind? Let him depend upon it, if he fail in obtaining an affirmative answer to these questions, that the method pursued, however sophisticated by pretence or innocent ignorance, produces extraordinary improvement only by enforcing injuriously close application, by unduly extending the time of study, and by a hurtful invasion of the period that ought to be allotted to recreation.

In establishments of the highest class, denominated *finishing schools*, the pupils are usually grown-up girls on the verge of womanhood, who are expected to remain but for a short time. The discipline is therefore more rigid, the encroachment on the time allotted to recreation is greater, and, as is proved by experience, it is at this period that the greatest mischief is frequently done to the form of the body. Unfortunately, the conductors of *elementary* schools, taking into consideration only the advantages to be gained by the rigid and compendious system pursued in the *finishing* establishments, are every day approaching more and more

to the intense exertion required by that system. They forget the difference in the age and understanding of the persons upon whom they wish to produce similar effects, *and they know not that they are operating upon a frame-work of bones, divided into at least three times the number of pieces that compose it when arrived at the adult age, and which, at the period of life we are adverting to, are very imperfectly connected together.* Every long bone in the body consists of three separate pieces in the child, and these do not become perfectly consolidated till the sixteenth, eighteenth, or in certain habits, even the twentieth year. Few teachers have any conception how much the natural growth of the bones is impeded by confinement and excessive mental application, or any other generally debilitating cause ; and as the *additional* demand that each instructress makes upon the time of recreation is not very great, it passes unobserved, at all events as far as regards the preservation of health. When, however, the spine gives way, there is always a voice in readiness to pronounce it the effect of hereditary disease.

Another powerful cause which leads to severity in education is the necessity of keeping pace with the *general advancement of knowledge.* Many girls, long before the period at which they are sent to school, betray all the curiosity and acuteness characteristic of the sex ; and from the conversation of those around them, frequently acquire a very

considerable share of information before they leave the paternal roof. These facilities of acquiring information have, doubtless, of late years, been very much increased ; and not a little is due to the very attractive form of many of our “juvenile publications.” By the aid of fable, narrative, and the productions of the graphic art, a young lady of the present day often enters the seminary with more information in her head, than occupied that of her grandmother on leaving it. But this superiority of acquirement only leads to the imposition of harder duty in the school-room ! Mrs. A. has seen and admired the wonderful progress of Miss B. at a school examination, and without ever stopping to ask the questions above proposed, or even to ascertain whether this specimen of unusual proficiency may not be simply an instance of precocity, makes every exertion in her power to render her own daughter a rival, at least, to the object of her admiration. He is either very charitable, or very simple, who is not fully persuaded that rivalry of this kind exists ; nor does he require any great study of the human frame to enable him to comprehend, that much incurable injury is often occasioned by these well-intended, but injudiciously-directed efforts at the attainment of an imaginary excellence. However much akin to envy, it would be cruel to censure this passion, the principle of which is honourable and just. Enough that it is a *passion*, and that, when predominant, it often proves injurious

to the delicate female, beyond even the worst wishes of an invidious rival.

Still, it must be remembered that this rivalry of parents and guardians, like that of teachers, has its origin from without. Whilst the heart and passions of man continue the same, the same effects may be expected to spring from similar causes. Till the eyes of parents are opened to the evils finally resulting from excessive competition, it is neither rational to expect that these evils will cease, nor just to insinuate culpability in those who are but yielding to the honest deductions of their own understanding, and to the influence of some of the best principles of human nature.

SECTION III.

Hitherto our observations have been limited to the enumeration of a class of causes intimately connected with the moral feelings of mankind, and which produce their pernicious influence by primarily undermining the health in general, and by weakening the back in particular. We are now to inquire into the nature of another class that operate more directly and mechanically, though in the end no less destructively ; but respecting which many of my readers may fairly be considered less open to conviction. "It is," says a classic writer, "an unpopular attempt to attack prejudices established

by time and habit, and secured by the corruptions of luxurious life; and it is equally unpleasant to attempt the reform of abuses without the least prospect of success."

But before entering upon this part of the subject, it will be necessary, in order to give my readers a just comprehension of the manner in which the above-mentioned agents operate, to put them in possession of some general knowledge regarding the structure of the flexible column of bones, conjointly known by the name of "*Back-bone*," and to acquaint them with the means which *nature* appears to have provided for preserving the symmetry and upright direction of this column, and for rendering it, at the same time, applicable to the various purposes of life. Possessed of this information, they will be prepared to understand how far her intentions are baffled or subverted by the agents in question.

The column of the back consists of a pile of small bones, technically denominated *vertebræ*, twenty-four in number, placed one above another in succession, so as to form a bony pillar tapering to its summit, and finally surmounted by the head, which may be considered its capital.

These small bones are connected together by the apposition of certain *processes*, (for it is thus anatomists name the smooth and polished projections growing from bones,) and maintained continually in their relative position by means of small bundles of strong, white, elastic, ligamentous fibres, attached

firmly to the margins of the processes in every two bones so connected together. By the skilful disposition of these polished projections, provision is made for allowing the column to be bent in almost every direction, as the wishes or necessities of the individual may require. Through the centre of this column runs a somewhat trilateral tube, for the purpose of containing the process of the brain, denominated spinal marrow; and on its summit rests the head, usually, in an adult, from seven to ten pounds troy* in weight. A plane dividing the crown of the head, in the direction from before backwards, and continued vertically to the ground, when the individual is standing erect, and looking straight forward, in the natural state, divides the back-bone into two halves. The spine, therefore, in relation to the plane on which the person stands, and which intersects at right angles the dividing plane, may be said to be *vertical*, although it is also naturally curved *anteriorly* and *posteriorly*. The vertical position is maintained, while the column itself is enabled to bear the weight of the head without giving way under the burthen, and also, after performing all its various inflexions, to regain the vertical position, by means of two very considerable masses, or cushions, of muscles,

* The brain alone usually weighs about four pounds; the cranium, or containing bones, three.

placed one on each side of it, and attached to various projections from the individual bones. So admirably are these muscles arranged, that, when left to nature, and uninjured by vitiated habits, they have the effect of exerting such a balancing power over every separate bone upon that placed immediately beneath it, as to keep the whole pile not only at rest, but absolutely upright in regard to its lateral aspect.

Now, it is a law of the animal economy, that whenever the natural and healthy operations of any organ, or set of organs, are either not regularly, or not sufficiently exercised, the organs whose operations are so disturbed or omitted, suffer material injury, in a proportionate loss of their capabilities of action. In some instances, indeed, the derangement so produced gives rise to active disease.

Again, organs, when they are too much exerted, or when their natural operations are kept up beyond certain limits, become fatigued, and incapacitated for the performance of their wonted office, until by repose they are enabled to obtain a renewal of their exhausted nervous power, and vital energy.

From a careful consideration of these two laws, the principles upon which the agents to be next enumerated, prove influential in producing inclination of the back-bone, may be easily gathered. They interrupt, or wholly prevent, the contractions of one class of muscles attached to the bony column of the

back, and they exert unnaturally the operations of another class ; the effects resulting from which irregularities we shall now endeavour to trace.

The uses of the two layers of muscles ranged on either side of the spinal column, as has already been stated, are to keep it erect ; that is, upright from the ground, (in relation to its lateral aspect,) when the person is at rest ; and to enable it to be bent at will, in any requisite direction within given limits, as well as to secure its return to the previous vertical position. In order to provide for the due performance of these operations, it has been explained that these muscles exert a kind of balancing power on each individual bone, so as to keep it properly poised upon the one immediately beneath it. It is evident, then, that the *free and unimpaired action of every individual muscle is necessary to the absolute integrity of the vertical state of the column.*

Now, of the causes to which we have alluded, the restraints of modern female attire stand pre-eminent, in not only preventing a due and sufficient play of many of these muscles, but, by interrupting entirely, at least during the day, the action of some of them, and by leaving others free to be called into motion, induce, in most instances, constrained positions of the figure. What lady, indeed, when dressed, and properly laced in corsets, furnished with steel, bone, or wooden busks, can bend her back, *keeping her knees together, and at*

the same time the whole lower limbs straight, while she is stooping forward to raise a pin placed at her toe? * To tie her own shoe-string, even, is an effort requiring from the fashionably-attired female not a few manœuvres, and only to be accomplished by assuming a constrained posture. Remove, however, the constraints of dress, and she instantly complains of weakness in her back — of inability to support herself erect. Nor is it matter of much wonder that she does so complain; because certain of the muscles necessary to her efforts, have, by a long-continued state of inaction, lost that poising power which they naturally possess, independently of the exertion of the will, and which is scientifically called their *tonicity*. They have lost their power of being influenced by the will, (their contractile power,) and, not unfrequently, being actually wasted in substance, have become so weak as scarcely to be able to support the body, or to perform any of the ordinary duties for which they were designed by nature. The means usually employed to compensate for this failing of the natural powers, is a more rigorous use of the very sources from whence it springs, — clumsy substitutes, moreover, for the inimitable contrivances of nature, thus too early sacrificed at the shrine of folly and caprice. “Persons adopting such means,” says an eminent

* She will attempt this by bending the trunk of the body forwards upon the *hip*, rather than by curving the back-bone.

French writer (Portal), “are sure to become distorted whenever the artificial props are removed*.” Nor, when deformity is produced, does discontinuing the use of stays remedy, but rather tend to aggravate, the evil, unless done with judgment and care; means being adopted in the interim to prevent the back-bone from yielding farther, till the necessary *tonicity* of the muscles be by freedom and exercise regained. When once the spinal muscles have become debilitated, and the body has been habituated to depend upon artificial support, that support must be removed with great caution; otherwise its discontinuance will increase the very injury proceeding from its use. That much harm, also, may arise from corsets being improperly made, or badly adjusted, is too apparent to require comment. It is equally superfluous to do more than hint at the bad effects resulting from the confinement of the chest, which they produce with respect to the organs of respiration; particularly in young persons constitutionally predisposed to consumption. Besides, the impediments which they offer to the proper motion of the stomach and bowels, and the consequent imperfect digestion of the food†, cannot

* The great philosopher, Locke, who was also a physician, remarked the same fact. “Whalebone stays,” says he, “often make the chest narrow, and the back crooked. The breath becomes foetid, and consumption probably follows.”

† It is well known that many young ladies, who are accustomed to lace tightly, are occasionally under the necessity of

fail to lay the foundation of many distressing complaints, and not unfrequently induces a premature and painful decay in all the powers of life. We know that fruit of any kind, if confined during its growth, withers and drops off the tree before it has attained one-half its natural size ; and, figuratively speaking, this would be the case in young females, did not the relief obtained by being undressed at night, in some degree compensate for the injury sustained

relaxing their stay-lace after dinner, in consequence of the uneasiness experienced from indigestion. It is by no means uncommon for all the symptoms of diseased heart to arise from the same source, which are speedily removed by a discontinuance of so injurious a practice.

The baneful influence of tight lacing, on the form of the lungs and liver, is familiar to every one who has had an opportunity of spending a winter in the dissecting-room. These organs are often found moulded into shapes the most distant from natural ; conforming, in fact, to the unnatural configuration imparted to the chest and lower ribs, resulting from long-continued injurious pressure. How, then, can they be reasonably expected to perform, in a proper manner, their peculiar functions, essential as these are to the preservation of perfect health ?

Nay, there are not wanting instances wherein this injurious practice has been carried even to a much more serious extent. We remember reading in the Times newspaper, a few years ago, a case similar to the following, which is extracted from the Nottingham Review, for Oct. 3, 1834:—

“ *Laced to Death.*—Harriet, youngest daughter of Mr. Tory, farmer, of Wisbeach, died suddenly on the 18th instant, in consequence, it is supposed, of being too tightly laced. A coroner’s inquest on the body returned the verdict,—Died by the visitation of God.”—[It should have been—*Squeezed to Death.*]

during the day. There can be no doubt, that, in many instances, life is actually shortened by modern fashion in this particular. It is not intended indiscriminately to condemn the use of corsets, or stays, but only to deprecate the existing fashion. The etiquette of society, and the present state of refined feeling, naturally impose certain restraints on female dress, as well as on female habits. It becomes, therefore, necessary to have recourse to artificial means, in order, in some measure, to counteract the prejudicial tendency resulting from these restraints, in a physical point of view. A moderate and equable degree of compression, given to muscles much called into exercise, so that it does not unduly interfere with their power of contraction, is undoubtedly beneficial. Such compression and support may be most advantageously derived from corsets, when well made, and not laced too tightly, destitute, at the same time, of back bones and busks, or only furnished with such as are sufficient to prevent them from crumpling into folds: otherwise, they become eminently injurious, inasmuch as they interrupt, or wholly supersede, the action of those muscles destined to support the trunk of the body; and impede, or entirely prevent, many of the natural inflexions of the spine. The application of these mechanical agents being a bad substitute for the adequate and beautiful provisions of nature, can therefore only be defended by pre-

judice*. Stays certainly prove doubly injurious if used before the body has acquired its full growth, yet it is during the time of development that they are more particularly worn ; it being found that, at this period especially, the body is capable of being moulded into any shape the fashion of the time may consider most becoming. A momentary glance

* The following passage, copied from Dr. Gregory's "*Comparative View of the State and Faculties of Man with those of the Animal World*," being the opinion of a sensible and observing man, is well worthy consideration.

"Some nations have fancied that nature did not give a good shape to the head, and thought it would be better to mould it into the form of a sugar-loaf. The Chinese think a woman's foot much handsomer if squeezed into a third part of its natural size. Some African nations have a like quarrel with the shape of the nose, which they think ought to be laid as flat as possible to the face. We laugh at the folly, and are shocked at the cruelty, of these barbarians, but think it a very clear case that the natural shape of a woman's chest is not so elegant as we can make it, by the confinement of stays. The common effect of this practice is obstructions in the lungs from their not having sufficient room to play, which, besides tainting the breath, cuts off numbers of young women in the very bloom of life. But nature has shewn her resentment of this practice in a very striking manner, by rendering *above half the women of fashion deformed in some degree or other*. Deformity is peculiar to the civilized part of mankind, and is almost always the work of our own hands. The superior strength, just proportion, and agility of savages, are entirely the effects of their hardy education, of their living mostly in the open air, and of their limbs never having suffered confinement."—Page 194.



Fig. 2.



Fig. 1.

at the annexed sketch will suffice to satisfy any one of the truth of this position. Fig. 1 represents the proper form of a naturally developed bust. Fig. 2 illustrates the effects of tight lacing*.

Persons arrived at a certain period of life, who, from an early age, have been habituated to the use of artificial means for the support of the body, and whose conformation has of course suffered accordingly, find it, as we have already stated, almost impossible to lay aside the use of stays; but the child

* As this is a very important point, I may be excused dwelling so long upon it, and venture to introduce one more authority in confirmation of the universality of the sentiments expressed in the foregoing pages:—

“Le mode di vestire sono sì bizzarre, che nascono spesso e deformano la natura, fin a pervertirla da non riconoscerla più.

“I piedi de' cittadini ristretti in scarpe attillate, e puntute, non sono più i piedi.

“La natura vuol che le donne sieno madri, e perciò le ha fatte di *anche* slargate, e ha loro dato un *vasto bacino*. Dunque s'incassino e si comprimano quanto più è possibile in un *busto d'ossi e di ferri*, affinché crepino di dolori. Testa alta, petto elevato, piedi in fuori, ginocchi in dentro, mani sostenute, prescrivono i maestri di ballo. Ma i maestri dell' arte fecero le teste leggermente inclinate, perchè la gran madre natura così le fa, per aver così disposte le vertebre. Sollevar il petto, è un forzare la respirazione. Torcer piedi e braccia e mani è un quastarne tutta la muscolatura. La situazione più comoda di ciascuna parte, nelle differenti posizioni del corpo, è la situazione la più naturale. Dunque è la più graziosa; la vera grazia non può essere che nella sola naturalezza.”—*Milizia's Dizionario delle Belle Arte: article Moda.*

who never has required mechanical support, never will require it, provided the system of physical discipline be constructed on better and more scientific principles.

The prevailing notion appears to be, that corsets not only prevent, but have a tendency to remedy distortion of the back. The mechanical support they afford, and the artificial shape they impart, are alone taken into account in the formation of this opinion. The indirect and injurious effects they produce, by sapping the very foundations of natural vigour, are either never adverted to, or are not permitted to exert a due influence on the mind.

SECTION IV.

In the last section our attention was principally directed to the influence of partial impediments to the proper and relative action of certain of the muscles, destined to preserve the body in equilibrio. We now proceed to detail another set of circumstances alleged as tending to promote obliquity of the spine; but of an opposite nature in their operation; viz. *Frequent, unduly protracted, or excessive exertion of the muscles and ligaments that support and connect together the various portions of the spine.*

Before entering upon this part of the inquiry, it will be necessary to give a general outline of the

structure and functions of those parts on which the operation of the agents alluded to depends.

The human body, as far as regards our present views, may be considered “ *as a machine composed of many distinct levers, moveable one upon another in various degrees both of extent and velocity.*”

The bones, generally speaking, are the levers ; the muscles are the moving powers ;—a function which they perform by shortening themselves on the impulse of the will, communicated to them from the brain, through the medium of the nervous system. In some instances, and under certain circumstances, their contraction may be said to take place *instinctively*—*i. e.* independently of volition. In either case they will have the effect of turning the lever round on its supported end ; for they cannot bring their extremities nearer to each other, the evident result of contraction, without also bringing along with these the body, or bone, into which they are inserted. In order to facilitate this action, nature has made the ends of the bones remarkably smooth and round, so that they may move very easily upon one another ; and between some of them are inserted moveable, but well-fitted, pieces of cartilage, by which they are enabled greatly to extend their motion. This is the case more especially in the joints of the spinal column*. By habit the muscles acquire the power of effecting all the motions of the body, with

* In these joints they receive the name of intervertebral substance, and differ in some respects from true cartilage.

any degree of force, within certain limits. This power is most intimately connected with the state of the general health, vigour, and integrity of the animal organization. For this reason, prize-fighters, wrestlers, and runners, endeavour, by training, to raise their general health to a *morbidly** high pitch, before they attempt the performance of their feats.

The muscles are for the most part disposed in pairs on each side of the body ; and though the bones on which they rest are modelled, and deeply impressed by their action, they never, except favoured by the circumstances we are considering, occasion the smallest deformity.

Having premised this outline, it remains for us to inquire, whether an *unequally divided action of these symmetrical masses of muscle, even in a vigorous and healthy individual, if frequent, excessive, or protracted, may not impart an unsymmetrical form to the bones* : and if so, how much more easily would the same forces induce deformity in the delicate female, whose general health has either previously suffered, or is simultaneously being undermined.

* This expression, however paradoxical it may appear, is still admissible and correct, for no one will maintain that any state of the body tending actually to shorten life, is natural ; yet this is the condition of these persons. They arrive at it by artificial means, and cannot long sustain it without endangering their existence. The physical power that may thus be attained, though truly astonishing, is, for the most part, inadequate to the draining fatigue of steady labour.

That an unbalanced impulse, acting on the spinal column, may produce a change in its direction, is evinced by the high right shoulder of ploughmen; a most healthy order of society, and whose bones are found to be of the firmest texture. I have a case before me of a young lady, eighteen years of age, who has never been subjected to any improper constraints in dress, and who has been allowed full permission to roam about almost at pleasure in the country, who is nevertheless very much deformed*. She has a slight congenital malformation of the left foot, which causes her to walk a little lame, to which circumstance the deformity is attributable; for just as lateral curvature may produce a shuffling manner of walking, so a halting gait may, in time, produce a lateral curvature. In like manner, the advanced shoulder and awkward step of the ploughman may be attributed to one foot being always in the furrow, when engaged in his daily avocation.

Sailors have generally the spine bent *forwards*, a characteristic which Smollett did not neglect to bestow on his *beau ideal* of a British seaman, Commodore Trunion. This stoop, or bend in the back, is most remarkable in men who serve on board the larger vessels of the line, owing to these vessels having several decks, the height between which is scarcely sufficient to permit a man of ordinary stature to stand upright. It is notorious that artizans

* The deformity in this case is on the left side.

generally contract some bend or twist in their backbone or limbs so characteristic as to enable a practiced eye easily to judge of their respective pursuits, without any other information than what is derived from their appearance. Clerks, and other sedentary persons, frequently contract the lateral, or twisted curvature. "I have seen," says Mr. Bamfield, "instances of *lateral curvature* produced by a habit of long-continued inclination of the body to one side, after the adult age, in insane persons." Of this I have a remarkable instance, at the present moment, under my care, contracted entirely by the habit of holding the left hand constantly to the side of the head; the head being likewise inclined to the left side to meet it. "Young artists of both sexes are liable to lateral curvature, from adopting a habit of sitting before their paintings and drawings, with an inclination of the body to the left side; with the left arm resting on the elbow, or hanging by the side; sometimes with the palette in the left hand, whilst the right arm and shoulder are raised, for the purpose of directing the pencil, and the head is directed to the left shoulder. In this position the spine is kept in a state of lateral curvature for a long continuance of time*." Dr. Harrison informs us that, among the colliers of a particular mine in Lancashire, who are obliged, from the thinness of the stratum, to sit in a bent posture, and force their right side into the vein, while digging out the coal, the spines of all

* Shaw.

of them become, in process of time, curved towards the right side. This very influence of occupation in individuals of a decidedly healthy class, is a proof that the primary causes of the deformity may *sometimes* be referred to the action of the muscles alone*. It is astonishing to see the pertinacity with which some writers assert, that the lateral curvature is never found except in females, and insist upon its inseparable connexion with constitutional disease ! In fact, among the male aborigines of London, the practice of *giving* the wall by the left, and *taking* it by the right shoulder, which originated in their narrow crowded streets, something less than a hundred years ago†, has given an advance to the right shoulder, and an obliquity to the trunk, by which some have imagined they may be easily distinguished amongst other men, and which vain new-comers often awkwardly imitate, from an idea of this style of walking being fashionable.

Admitting, then, that unsymmetrical muscular action *may* produce lateral deformity, it will be argued, that this can hardly be the cause of its appearance in the numerous young ladies whose parents and teachers are at so much pains to preserve an uniformity in their mode of action ; unless, indeed, imperceptible deviations from symmetrical action in

* A young person was lately under my care, in consequence of a *double* curvature of the spine, brought on by the habit of always nursing her child in her left arm.

† Boswell's Life of Johnson.

these individuals, be assisted by a favourable state of the levers or bones themselves. The back-bone, we have seen, is a pillar built up of twenty-four short cylindrical bones (vertebræ) piled one upon another, and extended from the large solid bones, that support the body when sitting erect, to the lowest part of the head.

The bodies of these vertebræ are separated one from the other by means of a strong elastic substance of considerable thickness, and are girt all round by a powerful ligamentous band. This substance retains the two vertebræ, to which it belongs, continually together, and though, strictly speaking, it prevents all immediate motion of one bone of the spine upon another, permits of most extensive motion of the whole column of bones taken conjointly, by means of the great elastic power of which it is possessed. To whichever side the body inclines, this substance readily yields, and returns in a moment to its proper position, by a very powerful resilience, when the weight of the body, and force of the muscular contraction, have ceased to operate. As this substance is continually yielding under pressure during the day, a person of ordinary stature will often be found considerably taller in the morning than at night. In old age, the body is shorter than in youth, from the greater condensation of this substance; and its inclination forwards in persons advanced in years, depends upon the yielding of this compressible substance to the weight of the

superincumbent structure. Hence, any undue inclination to either side, during life, if frequent, constant, or protracted, will cause a certain diminution in the thickness of this substance on the side to which the body inclines, accompanied by a proportionate rising of the same on the opposite side; and will, in the course of time, produce permanent distortion of the whole column of bones. This effect will be more easily produced during childhood, when the bones are in a state of growth, the ligaments more yielding, and the intervertebral substance is peculiarly soft. “A tumor on the head or jaw, which makes a child carry the head to one side; or constant stooping, such as is used by a girl in working at the tambour; or the carrying of a weakly child always on one arm, by a negligent or awkward nurse, without the aid of undue muscular action, will cause, in time, a fixed and irremediable distortion* ;” — the result of the compression, and consequent absorption, of the intervertebral substance.

Each of the four-and-twenty *vertebræ* is a lever, whose *fulcrum*, or *support*, is the upper surface of the vertebra upon which it rests.

The *moving power*, we have seen, is composed of various muscles inserted into the sides, and into the back of each vertebra. For these insertions there are processes, or projections, that jut out like handles,

* Charles Bell's Anatomy.

and allow the muscles to take firm hold, so as greatly to increase their *purchase* in moving the spine.

This curious, yet simple mechanism, being comprehended by the general reader, he requires but to be told in addition, that the whole muscles of the back are designed for keeping the spine erect, and for inclining it, when necessary, to either side; also, that those attached to it, on the fore part of the body, bend it forwards. He is then in possession of all the scientific knowledge, relating to its physical structure, that is indispensable to enable him to understand the theory of its curvature.

SECTION V.

Such being the apparatus and its use, a word or two on the chemical composition, as well as on the growth of bone, will further aid us in our inquiry.

When put into dilute nitric acid, or aquafortis, bone soon becomes soft and yielding, though it retains the figure and dimensions it previously possessed. A similar change takes place in the bones of those afflicted with the variety of rickets that attacks grown-up persons. In both cases, it is well known that the phenomenon depends on the removal of an earthy matter, named phosphate of lime. The bones of infants contain scarcely any of this element till a short time before birth; and, accordingly, are very soft and flexible. As more

earthy matter is added, the bones become harder, firmer, less flexible, and more easily broken.

This hardening of the bones goes on till the prime of life, at which time no trace of the soft part, or cartilage—the true mould of the bone—can be detected by the eye;—when there is, in reality, twice as much earth in its substance.

The rate of this addition, however, to the substance of bone, is modified by various causes. The manner in which it takes place has been carefully ascertained by observation; but it would be a tedious question to entertain at the present moment, though far from being foreign to the subject. Suffice it to observe, that the growth of bone bears a direct relation to the activity and vigour of the circulation of the blood, and is modified by the state of the general health of the individual; so that whatever accelerates, while it supports the circulation, without injuring the general health, promotes their consolidation. It follows, then, that unless a due supply of blood be afforded to the bones of the spine, they will be so much nearer to the state of cartilage than they ought to be; and will consequently yield more readily to the operation of any undue or partial pressure: until, moreover, the ossific process be completed, deposition is liable to occur on the part left free from pressure, and thereby to increase its length. This vitiating process will be aided by the facility with which the substance interposed be-

tween the vertebræ yields to the superincumbent weight.

The state of deficiency in the consolidation of the bodies of the vertebræ, which we have been endeavouring to explain, results, in very many instances, from the present system of conducting female education. The perpetual restraint under which a girl is kept from the first dawn of intellect, and the inordinate calls made upon her mental, as well as physical powers, rob her of that exercise to which nature prompts, and fritters down, subdues, or destroys, her emotions; yet, by exercise alone, can the voluntary muscles acquire vigour and power, or the circulation be properly balanced, and the reciprocal dependence of the various systems of the body upon each other be maintained. The strength and bounding state of the pulse, in a stout and healthy peasant, may almost be deemed the effect of some awful disease of the heart, when compared with its feebleness in a delicate female. “The might that slumbers in a peasant’s arm,” equals what may be referred in the delicate girl to some tremendous excitation of the nervous system. Excitement, indeed, there is, in the former case—but such only as the bounty of nature hath, more or less, supplied to all—though the fashions of the times lead many to deny it to themselves and to their offspring. The action of the peasant’s heart, yielding to the natural emotions of his soul, in the

fulness of vigour and health, sends forth a current of well-prepared blood to nourish every fibre through which it bounds, and thus produces the Herculean symmetry that marks his manly form. In the accomplished lady, from a fashionable and sickly dread lest the form, losing its Corinthian delicacy, should become “stumpy” and “stout,” — lest the reason and the passions, by once obtaining their natural sway, should render the mind decisive and unbending, — every artifice is employed to avoid the fundamental causes of a vigorous circulation. She is stinted in her food, confined in her dress, and burdened with unprofitable occupation. Her desire for action is curbed by customs which she may not transgress — by authorities which she dares not disobey — and at which she fears even to express her dissatisfaction. A weak, and often a diseased heart ; a languid circulation ; a pale, pinched face, and cold extremities, with frequent chilblains ; hysteria, and its Protean attendants, are the results, and the index of the feeble powers by which the blood is moved, in the proverbially “puny boarding-school girl.” How, then, can a due deposition of earthy matter, on which the necessary consolidation of the bones depends, go on as it ought, under such a deprivation of the vital force ? This process demands a vigorous circulation ; yet every possible means are taken to render the circulation weak : it is effected by the vessels carrying an abundant supply of the more highly-coloured part of the blood ;

yet ingenuity is exhausted in devising means to lessen this supply, by diminishing their number, and weakening their activity. The bones of the spine, consequently, in such young persons, never become firm, yield easily to the superincumbent weight, aided perhaps by the force of the muscles; and thus, being disposed to grow unequally, impart to the spine a lateral inclination of longer or shorter continuance. This inclination, before any structural change has taken place, may be said to be merely *temporary*, and is capable of being removed at pleasure; but, if the application of proper means of prevention be delayed beyond a certain period, will, as we have seen, soon become *permanent*.

Such is the cause generally *predisposing* the spine to become laterally curved. The unequal action of the muscles is the *impelling* power, and is denominated *the exciting cause of lateral curvature*. The *weight*, however, *of the head, upper extremities, and trunk*, evidently must add to the influence of the muscles, in producing any deviation from the perpendicular in the vertebral column. The mischief does not end here: the general health is insidiously and gradually impaired; and, though not so much injured as to be considered in a state of absolute decline, is in that condition usually denominated *puny and delicate*. The natural functions not being discharged in a vigorous or perfect manner, the deformity proceeds, in such a state of the system, by slow and insensible degrees. At

this period, however, the supervention of any acute complaint—such as fever, inflammation, or any of the eruptive diseases incidental to youth, which induce great debility—causes the progress of the curvature to become more rapid,—at least until the strength of the patient be restored.

The cartilages, ligaments, and muscles, being supplied with nourishment from the same source as the bones, suffer equally from the same privation. The muscles become not only more languid and feeble than they ought to be, but are sooner exhausted. The lassitude that, necessarily from these causes, pervades the general carriage of the child, forces her to acquire insensibly a habit of stooping. This, being attributed by the unconscious teacher to indolence, is combated by enjoining a more rigorous attention to constraint. The girl is constantly reprimanded for not “*sitting up.*” This she cannot do, but, in the effort, contracts imperceptibly a worse habit, that of *balancing* the body; by which, while seemingly obeying the injunctions laid upon her, she eludes observation. A person seated upon a chair or stool may throw the weight of the head, trunk, and upper extremities, upon either of the hips, almost without any apparent deviation of the spine from the perpendicular, by drawing the spine to one side, and leaning the head and neck slightly to the other. It is this position that proves so injurious to the child

when engaged in drawing or writing*, or when playing upon the piano or harp. The right hand being, in all these occupations, that which requires most scope for motion, occasions the right shoulder to be raised ; and in order to facilitate this, the balance of the body is maintained on the left hip. The harp, calculated, perhaps, the best of any instrument to display to advantage an elegant form, is not on that account the least objectionable. It proves the most detrimental possible to the system in early life, and should never be commenced until the body is somewhat formed, and the bones have acquired a corresponding degree of solidity. The most approved mode of sitting, moreover, when performing on this instrument, is a twisted position. A very distressing instance of deformity, arising entirely from constant practice on the harp, and playing exclusively the bass parts of duets with her sister on the piano, fell under my notice some little time ago. The young lady being passionately fond of music, de-

* For these purposes I recommend a table, hollowed out, so as to fit and partly encircle the body ; or one to which is attached a moveable leaf, that proceeds out at right angles from it, so as to support the right arm, without putting the person to the necessity of twisting the body to obtain support. The child should sit upon a graduated, or screw-stool, and allowing her arm to hang down by the side of the stool, the seat should be raised until the elbow come exactly on a level with the additional leaf. A frame should support the feet, the knees and hips being bent at right angles.

Fig 1.

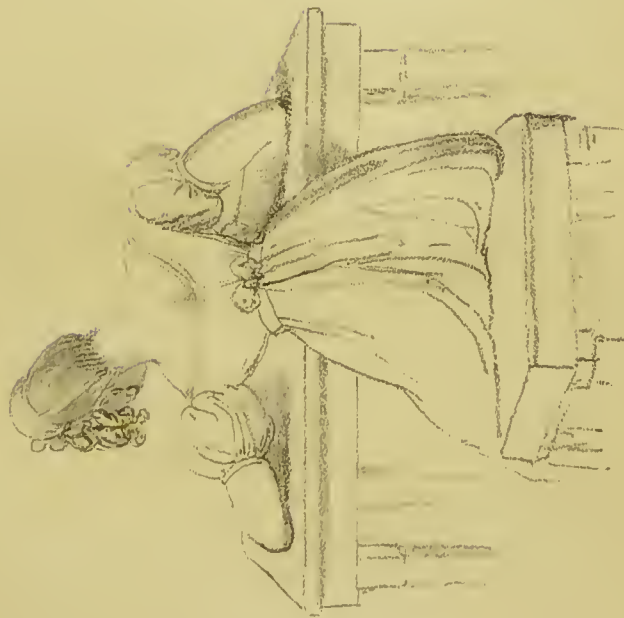
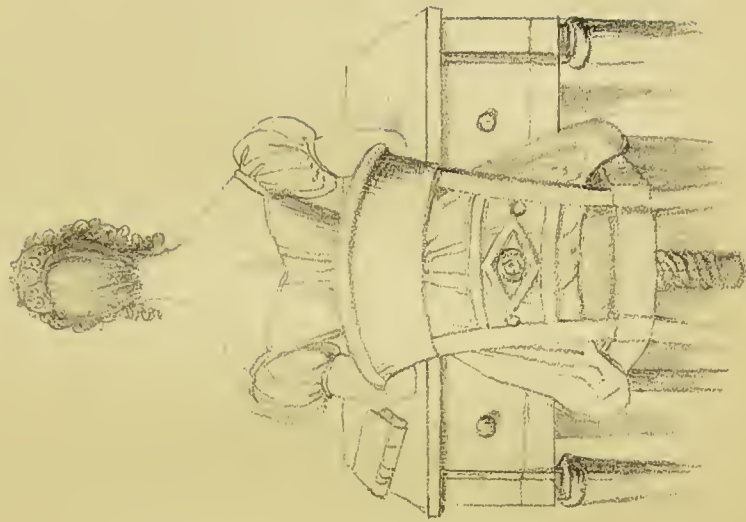


Fig. 2.



voted hours daily to her favourite pursuit ; and being of a naturally delicate physical conformation, her back was unable to resist the combined influence of assiduous application, and the want of that recreation and exercise necessary to preserve health. The deformity advanced slowly and imperceptibly, and attracted but little notice, until it had become tolerably confirmed. Unfortunately, when detected, the most injurious treatment, founded on a mistaken view of the nature and causes of the malady, was adopted. The remedy was sought, in the imposition, on the part of the governess, of injudicious restraint : the aid of a dancing-master was called in, and finally the machinist completed the mischief. Months of diligent attention, and great sacrifice on her part, have been requisite to improve, even slightly, her condition, and many more will be necessary to reinstate her form,—should this desirable end, indeed, ever be accomplished.

SECTION VI.

On another evil of the highest importance, resulting from the present system—one great cause, indeed, of the continuance of the mischief—we have hitherto withheld any remark. It has been shewn that the bones may, in early life, become distorted from various causes. Now, it has been inquired,

and with some shew of reason, whether *the form thus produced may not be propagated in the progeny of such a parent?* A bent back, a wry neck, or a high shoulder, has been known to run, for many generations, in the same families; though no other hereditary constitutional peculiarity or disease could be traced in them. Nor is it more difficult to conceive that the bones of the child may resemble those of the parent, than that the lineaments of the face, and the dispositions of the mind, may present an hereditary similarity. “It is a fact,” observes Cuvier, on the Domestication of Mammiferous Animals, “universally recognized, that the young of animals have a very strong resemblance to the individuals which have given them life. This fact (continues he) is as obvious in the human species as in any other; nor is it less true with reference to the physical qualities than to the moral and intellectual faculties. Now the distinctive qualities of animals of the same species—those which have most influence over their particular existence,—which constitute their individuality—are those which have been developed by exercise, and whose exercise has been called forth by the circumstances amid which these animals have lived. Hence it follows, that the qualities transmissible by animals to their young,—those which give rise to a mutual resemblance in them,—*are of a nature to arise from fortuitous circumstances*; and consequently we are enabled to modify animals and their progeny, or

their race, within the limits which bound our power to produce the circumstances calculated to act upon them. With reference, then, to the human race, man thus obtains the privilege, not always the most enviable, of stamping upon his posterity a double identity ; that derived from physiognomy, applied to the development of the form, as well as to the features of the face ; and that of constitutional peculiarity and organic debility, varied according to the character of his habits and manners, which are thus continually reflected, and transmitted to posterity." Man has, unfortunately, been regarded too much as a being whose habits and laws of life and perpetuity have little or no relation to those of inferior animals. Though the comparative anatomy of animals, as regards the structure and mechanism of the body with that of man, has been extensively investigated, yet the comparative animal economy of mankind and other animals, and comparative views of their states and manners of life, (it has been correctly observed by a philosophical modern writer,) have been little regarded. "The pride of man," says he, "is alarmed in this case, with too close a comparison, and the dignity of philosophy will not easily stoop to receive a lesson from the instinct of brutes." Nor is it to the animal kingdom alone that such a change is confined : we trace it even in the vegetable creation. Do not plants, under the hands of an expert cultivator, acquire qualities absolutely new ?—a character they

did not primarily possess; and are not these the result of fortuitous circumstances in the first instance, retained afterwards within the limits which bound our power to influence this development? In the human species, progressive civilization, as manifested in manners and customs, civil and domestic, moral feelings and their concomitants, are the powers which operate on the temperament, increase the nervous sensibility, and often, through it, impair the physical organization, or even destroy life itself.

This opinion has been attempted to be controverted by a frivolous and ill-founded argument, that if defects of the person, not depending on constitutional disease, can be transmitted to offspring, we should daily hear of children being born without legs, arms, and fingers, of parents who have lost these members from accident or disease. But the cases are not parallel. In short, there is no similarity between defects which have *originally* been, or have ultimately become, constitutional, and those which, being accidental and local, do not affect the general vigour of the system. Besides, no one can deny that parents, whose peculiarities of form are known to be wholly independent of constitutional disease, as those consisting of certain defects in the number of toes, fingers, or limbs, or redundancies of the same, very frequently transmit such peculiarities through several generations of their descendants. But this question may now be considered as set at rest by Geoffroi St. Hilaire, who most satisfactorily demon-

strated to the French Academy, some years ago, that members never become deficient unless the nerve which supplies them has not been evolved.

In the bones, however, not only the form, but also the structure and degree of aggregation, may be similar in parent and child. If in the bones of a mother, during youth, the circulation has been languid, the consolidation slow and imperfect, or the form biassed by muscular action, it may reasonably be expected, at least under the present system of female education, that a tendency to these states of the bones will be developed in her children, *although she may be entirely free from those frightful constitutional diseases to which such a tendency is frequently ascribed*. In a word, in the offspring of such a mother the bones are frequently soft for the same reasons that the muscles are flabby, and that the features are similar to those of her parent.

Let such parents, then, as would willingly forego the cultivation of a morbid delicacy of appearance, attend to the following simple maxims; by which they will not only leave their children sufficient time for elegant accomplishments, but confer on them the inestimable blessing of a sound and vigorous mind in a healthy body.

Do not forget that, in the philosophy of education, doubling the power does not always double the effect. The *second* hour of study is seldom half so good as the *first*; the *third* is much worse than the second: there is, in fact, considerable

truth in the remark of the child, that it “forgets in the fourth hour what it learnt in the first.” The effective part of study, as well as of racing, decreases in proportion to their duration. Students, in university classes, find an hour sufficient time to devote exclusively to one subject. That which delights at the onset, becomes irksome and tedious if the application be incidentally prolonged beyond a moderate limit, and soon induces a feeling of exhaustion. The same effect results when the attention is too long kept fixed by any public exhibition. It follows, then, that time is actually *lost*, when consecutive hours are devoted, without relaxation, to mental pursuits. The time thus wasted, if spent in recreation, is more than sufficient to allow of the mental powers being fully renovated by the period at which, under ordinary circumstances, the jaded scholar begins to leave off study. Experience teaches us, besides, that nothing would be lost by this intervention of amusement, but that an actual accession would be made to the acuteness of the individual.

This reasoning applies also to another very material point in the development of the physical powers — *the making too early a call upon the mental faculties*. It may fairly be questioned, whether scholastic tuition does not, in most instances, prove more injurious, than beneficial, to children before the attainment of the sixth year of their age. It may be argued, that many prodigies have astonished the

world before the completion of their fourth year. We do not, however, often find, that the intellectual powers outstrip the growth of the body, but, on the contrary, that they increase in strength, as it increases in vigour and magnitude*. From this correspondence between the powers of the mind and those of the body, it is highly probable that the brain and nervous system—the organs of thought and volition, are not prepared for continuous exertion of these functions at a very early age. The infant mind is incapable of being occupied by the numerous and more complicated relations of our sensations and ideas to one another. It is unnatural to the brain, at that period, to be much exercised for these

* This, of course, must be understood to apply within certain limitations only; since there is every reason to believe, that the mental principle, as well as the vital movements, have relation to certain physical development in size, as well as in form. The latter appear to execute themselves with a rapidity the inverse of the magnitude of the animal; and what large animals gain in force, they lose in agility and address. The application of this principle has been made to the female part of the human species; and the circumstance of women having forms so much smaller and more delicate than the male, has been deemed one cause of their greater precociousness and mobility.—PALIN.

Unfortunately, most of those who have studied the philosophy of the mind, have been but little acquainted with the structure of the human body, or with the laws of the animal economy. Yet the mind and body are so intimately connected, and exert such a reciprocal influence upon each other, that the constitution of either, examined apart, can never be thoroughly understood.

purposes. Such exertions can only be effected by a more rapid supply of nutritive blood to the organs used. A supply of nutriment, however, so afforded, not only drains the resources of the rest of the body, and diverts the energies, which before were wholly expended upon the animal system, into other channels, but often lays the seeds of disease* in the nutrifed organs themselves, to be fostered by the first genial coincidence. It must, then, be better to make only such calls for exertion on the mental powers, as can be answered without destroying the balance of the circulation throughout the system. Previously, therefore, to the evolution of these powers, a child had far better be entrusted to the charge of a benevolent, well-informed superintendent, than to that of a tutor.

A particular talent manifesting itself at a very early period of life, may, in some instances, perhaps, be cultivated to a certain extent with impunity, as its culture, being a gratification to the individual, may be presumed to be productive of healthful recreation, without being attended by too great mental exertion : but, unfortunately, in too many instances, an undue advantage is taken of precocity, and that which was designed as a blessing, is thus

* As, of that inflammation of brain terminating in effusion of serum, popularly known by the name of "water in the head." It is a remarkable fact that precocious children are the most frequent subjects of this disorder.

converted to the opposite. To cut off the source of a delight so pure as that which thrills through the bosom of a parent while encouraging the early expansion of the intellect of his child, may appear harsh and unnecessary: but we should ever bear in mind, that what is unnatural is not lasting; and that they who foster the blossoms, which are the precursors of spring, and not its products, gather little but disappointment. Though we read in mythology of the infancy of Hercules, and, in history, of the childhood of Bacon and of Johnson, the popular notion is not the less devoid of foundation, that generally—nay, almost universally—precocity is either the symptom, or the cause, of physical debility, not unfrequently stunting the natural growth, or producing deformity in after life, or even shortening the period of existence. Of this our immortal bard seems to have been aware, when he makes the Duke of Glo'ster say of the young Prince Edward, “So wise, so young, they say do ne'er live long.” We know that fruit, bearing many of the appearances of ripeness, is not unfrequently found to have been blighted; that a plant by being forced, is generally deprived of its vigour; and that women, in countries where they arrive prematurely at womanhood, are prematurely visited by old age. The number of persons who have realized any remarkable promise of their childhood, is singularly small; a fact for which it would not be difficult to suggest a reason, were this the place for

such a discussion. I therefore wish to remind my readers, that if they urge too hastily the instruction of the mind, neglecting to lay a solid foundation of bodily health, they will probably deprive their children of both these blessings. The weak are certainly further weakened, and the strong are as certainly not further strengthened, by the too early exertion of their faculties. In short, premature genius ought seldom to be encouraged ; never to be sought for.

I would, therefore, be understood to mean, that the general education of children should not commence before the sixth or seventh year : and it will be found, by the eighth or ninth, to have produced on the mind greater improvement than if it had been commenced earlier.

Children, when sent to school at a very early period, as they often are, “ to be out of the way,” should not be kept in the school-room longer than for an hour at a time : yet it is customary, even at day-schools, to keep them confined from eight or nine o’clock in the morning, till two or three in the afternoon, without allowing them any interval for relaxation. Young children, in such cases, are often seen to sleep as they sit upon the form. In the drowsy inattention which does not proceed absolutely into sleep, the weight of the head, and the position necessarily assumed by the body, owing to the spinal column being left to support itself, produce a powerful influence on the intervertebral substance, and lay the

foundation of crooked spine. The child, if forcibly kept awake, being exhausted and fatigued by the sameness and uninteresting nature of her occupation, sinks into attitudes, calculated to produce, if possible, an equally injurious result. Teachers are so thoroughly aware of this progressive diminution in the power of attention and memory, from too long application to one subject, that they in general endeavour to avoid inducing it, by changing the object of study. Hence, in many seminaries, the same young person is often called upon to attend six or eight different masters in the course of the day. The fatigue, undoubtedly, is by these means materially relieved; *but still fatigue is produced*;—as any one may experience, who studies long, however varied, or agreeable, may be the objects of his attention. Were such effects avoided, by shortening the periods of study,—by interposing frequent intervals of vigorous, agreeable, recreative exercise,—the apprehension would be more acute, the conception more clear and distinct, and the memory more retentive. The robust health, which would then paint the rosy cheek, and lighten up the laughing eye, would make the heart of the parent as glad, as now it is anxious.

As at present constituted, the recreations and amusements permitted to girls in the middle and higher ranks of society, are *monotonous, insipid, and heartless*;—of a nature not at all calculated to excite either emulation, or any of the higher emotions

of the soul. Being confined by the awful importance attached to certain rules and principles, sanctioned by the customs of society, they generally demand but a limited degree of exertion ; and from being constantly restricted by the hand and eye of the superintendent, become few in number, at the same time that they are perverted from their natural connexion, and *denouement*. They are, in fact, rather exhibitions than recreations. There is not gained, by such pastimes, that gladdening of the heart requisite to relieve the wearied mind ;—the whole amusement scarcely amounts to more than a change of labour. Girls, therefore, when left alone, often prefer singing, or conversation, to exercises devoid of meaning, dignity, or interest. These and similar privations are “lady-like!”—because all ladies are subjected to them. But this is merely allowing the folly of fashion to prevail in spite of reason.

Let, then, the amusements and recreations of females be interesting and unconstrained—of a nature calculated to excite the more generous and noble passions of the mind—and they will be hailed as so many interludes of delight. Let them be various, and exclusive of none but such as are boisterous, violent, vulgar, or ungraceful ; and we shall do much towards obviating the evil we are considering, notwithstanding all the arts and sciences that are at present reckoned necessary to complete a course of polite education, and which make so

large a demand on the time of youth, in their acquisition.

No artificial means can be regarded as substitutes for active and judiciously guided exercise. This alone can preserve the frame of the body perfect in its symmetry. Young people have a natural propensity to activity. It is an ill-judged policy to curb, on every trifling occasion, the natural and buoyant spirit of young females, as though it were inconsistent with that delicacy and refinement which characterize the sex. "It is to be hoped," observes a judicious modern writer*, in treating of the beneficial effects of exercise, "that the period is not far distant, when, amidst the many and real improvements in education, more attention will be paid to this important point. In every system of education, at female seminaries, as well as at boys' boarding-schools, a plan of *regular* and active exercises should form an essential part; the want of exercise not only leads to general feebleness of the frame, and of the mind, but it frequently sadly interferes with the growth and development of the form." Females, then, should not be kept in confinement during so many consecutive hours, as is the practice in most modern seminaries. *The intervals for play or relaxation, if not somewhat more prolonged, should be of more frequent recurrence.* Girls should be encouraged to engage earnestly and with spirit

* Dr. Marshall Hall, on Diseases of Female Youth.

in such games of exercise and skill as are the most likely to prove beneficial in developing the form of the body.

To this end, an occasional walk, or ride in a carriage, under the eye of the governess, is not sufficient; and is, in fact, little more than an apology for exercise.

Carriage exercise, indeed, being passive in its nature, is calculated for convalescents, rather than for children in full health and vigour. Bodily exertion*, unless combined with mental amusement and exhilaration, produces comparatively little beneficial influence in the development, or even in the maintenance, of the physical powers.

The extent to which want of exercise is carried, in many boarding schools, will appear incredible to those who have not personally investigated the subject. The following *carte* of a Young Ladies' Seminary, drawn up by Dr. Forbes, and published in the Cyclopædia of Practical Medicine, is worthy of notice :—

* For young ladies educated at home, and arrived at a certain age, horse exercise is, in general, very desirable, when it can be attained. It must not be denied, however, that its propriety has been questioned. The awkward position in which a lady is obliged to sit, as well as the unequal use of the two sides of the body thus induced, it has been maintained, favour a disposition to curvature*. In cases wherein a slight obliquity already exists, the rider may sit on the off side of the horse.

* Benjamin Bell on the Bones.

- “At 6 in the morning the girls are called, and rise.
 From 6 to 8, learning or saying lessons *in school*.
 „ 8 to 8½, at breakfast.
 „ 8½ to 9, preparing lessons *out of school* (some of the girls
 permitted to do so in the garden.)
 „ 9 to 1, at various tasks, in school.
 „ 1 to 1½, out of school, but must not go out of doors;
 reading or working, and preparing for dinner.
 „ 1½ to 2, at dinner.
 „ 2 to 5, in school, at various tasks.
 „ 5 to 5½, at tea.
 „ 5½ to 6, preparing to go out; dressing or reading, or
 playing in school.
 „ 6 to 7, walking, generally arm in arm, many with books
 in their hands.

“Two days in the week they do not walk in the evening at all, being kept in for *Dancing*; but by way of amends, they go out on two other days, from 12 to 1, and then they miss *writing*. It is to be remarked, that *they never go out unless the weather is quite fine at the particular hours allotted for walking*. They go to church all the year round, twice every Sunday, on which day no *other exercise* is taken.

“From 7 to 8, for the older girls, reading or working in school (this is optional), and then prayers; for the younger, play in school, and prayers.

At 8, the younger go to bed.

From 8 to 9, the older, reading or working, as before.

9, to bed.

“Twenty-four hours therefore are thus disposed of:—

	hours.
In bed, (the older 9, the younger 10)	9
In school, at their studies and tasks.....	9

In school, or in the house, the older at optional studies or work, the younger at play	5½*
At meals	1½
Exercise in the <i>open air</i>	1

“The above account was taken from a second or third-rate school, and applies more particularly to the season most favourable for exercise, *summer*.”

Callisthenics form a class of exercises, in many instances, highly to be recommended.

When first introduced into this country, they were of much too athletic and violent a kind; but by judgment and experience, they are at length reduced to a series of graceful, dignified, and natural movements, admirably adapted to promote an equal evolution of the physical powers, and to call into action, in regular succession, every part of the muscular system. In the *prevention* of deformity these exercises, properly conducted, are invaluable, and by their influence on the general health, through the medium of the muscular system, have, in numerous instances, wherein obliquity has actually taken place, alone sufficed to remedy the evil.

It may here be proper to inquire into the merits of *dancing*, and the use of *dumb-bells*.

Dancing, as it combines the advantages of exercise with those of agreeable and exhilarating recreation, is extremely useful. When taught by a

* The younger only 2½ hours.

person who understands the principles of the science in a physical point of view, it may prove eminently beneficial in favouring a symmetrical development of the frame. In this exercise, for reasons that will presently appear more obvious, no fixed, or irksome attitude, ought to be enforced beyond the commencement of fatigue, but should be immediately changed for a state of perfect relaxation, more especially as regards the muscles of the spine*.

* It is of great importance that those who undertake this department should themselves be taught to distinguish between the effects of fatiguing positions and voluntary movements. The former are in particular favour with most dancing masters, who generally commence the lesson by requiring their pupils to stand in various irksome and unnatural attitudes for some length of time before allowing them to move. Under these circumstances, it must very often happen, when the teacher is ignorant of the physiology of motion, (and dancing masters, it may be presumed, are very seldom much versed in this subject,) that the weight of the body is thrown upon parts not intended naturally, and consequently not calculated, to support it; and, what is perhaps of still more importance, from the undirected nature of the exertion required, not sufficiently under the control of the will. Serious consequences from this cause are not of such rare occurrence as may be supposed. When *volition*, if we may so express ourselves, is wearied out, the muscles either neglect, or become incapable of performing, their duty, and those that have not been called into action, thus operate indirectly with double effect. On a similar principle we may explain why any sudden involuntary muscular effort, as where the heel slips in going down stairs, may fracture the kneecap,—a result that could not proceed from any voluntary muscular exertion; because the parts acted upon—the resisting powers—

The arms ought to be used as much as possible, in order that they may be developed equally with the lower parts of the body. With this view, some teachers are in the habit of requiring the performance of certain Callisthenic exercises, previous to the commencement of the ordinary lesson. Dancing, practised to excess, is very apt to injure the finer proportions of the limbs, by developing too fully those parts more particularly called into action*. Thus, in our best opera dancers, the ankle and calf of the

are then equally as prepared to receive the impulse, as the organs by which that impulse is communicated.

Dancing, as well as Callisthenics, then, to be taught on *rational* principles, should include no movements that exceed the limits affixed by nature to each particular joint. This, in reality, is the true boundary of elegance and grace. All movements, or attitudes, that go beyond these limits, may be wonderful, but they are neither graceful nor elegant; and are always performed at some sacrifice of the physical structure of the parts concerned in them. The requisite exertions, moreover, should be performed with gradually increased power, and alternated with rest in postures calculated *naturally* to afford it,—such as are unattended by muscular effort for their continuance:—otherwise they do not fulfil the design indicated.

* The fine development of the ankle and calves of Parisian females is attributable to their being accustomed to walk so much on *tiptoe* along the ill-paved dirty streets of their metropolis; and the thin spare calves of country waggoners arise from their usually wearing thick unyielding soled, laced, or half boots, which prevent them from bending the foot, and raising the heel in walking, so as to exercise and develop the muscles situated in the back part of the leg, which constitute the calf.

leg are often clumsy and herculean, compared with the slender, skinny arms, of such persons. Those, on the other hand, who practise horsemanship and tumbling, are much better proportioned, because their exertions are not confined to the lower extremities, but bring all parts of the body equally and alternately into play. Professional dancers, moreover, are seldom remarkable for grace in any of the ordinary movements of life. In the performance of these they are generally constrained, formal, and automatic. The bad effects on the form of the foot, resulting from overstretching of its ligaments, are well known. Very few opera dancers can boast of a good instep off the stage. When the foot is placed on the ground, the arch of the instep yields to the weight of the body, and allows the concave part of the sole to rest on the same plane with the toes. When, therefore, these persons walk, they never rise on the toe, nor bend the foot. From their habit of turning the toes very much outwards, they acquire a peculiar mode of walking, usually denominated “a strut;”—by some, “shailing;” a term more properly applied to walking sideways.

These observations apply to the bad tendency of dancing practised to excess, or when the movements are carried beyond the natural limits, and are intended to point out how questionable is the propriety of devoting much time to this accomplishment, with a view to the attainment of more than graceful and natural habits of motion.

Dumb-bells.—The exercise of the dumb-bells forms, perhaps, a portion of school discipline in every seminary for the instruction of young ladies. The dumb-bells ought to be used regularly once or twice a day, for the continuous space of five or ten minutes. They should not weigh more than from three to four pounds each, for children from six to ten years of age ; and from four to six pounds, for those from ten to fifteen. Every school ought to be furnished with several pairs of these bells, *varying in weight*. An explanation of the proper mode of performing an exercise so common, however superfluous it may appear, is by no means unnecessary. I have seen girls, who have been taught to use the bells at school, handle them in a very injurious and improper manner. I have observed them, while swinging these weights backwards and forwards, poke out the head and neck at each alternate movement of the body in a manner calculated to render the exercise worse than useless.

To use the bells with advantage, the young person should stand perfectly erect, place the heels together, and point the toes slightly outwards. The bells being grasped one in each hand, are raised simultaneously towards the front and centre of the chest, and approximated, so that the corresponding balls of each bell may touch each other respectively. They are then to be projected horizontally forwards, *but not forcibly*, to the full length of the arm, and, with the arms kept extended, allowed to drop

with sufficient force to swing them gracefully round the body. The arms must be gently turned out in their course downwards, so as to make the balls on the *outer*, or *thumb* side of each hand, approximate or strike against each other behind the back, the elbow joint being kept as straight as possible. The bells are then to be again brought round to the front and centre of the chest, and propelled in the same manner for twenty, thirty, or any number of times, that may be deemed necessary.

The common fault in using the dumb-bells consists, either in *not turning* the arms outwards, as they are swung round the body, or in twisting them *inwards*. The fault in either case causes the child to elevate the shoulders in endeavouring to make the balls strike each other behind the back, and at the same time forces her to thrust forwards the head and neck, so as to defeat the purpose for which the exercise is designed.

Or, the weights may be gradually raised, at the full length of the arm, from the sides, till such time as they are brought into contact above the head, and then, the hands being turned *outwards*, should be allowed to fall slowly, and steadily, backwards, until the back of the hands meet, as in the former case. This mode of using the bells being more difficult, from requiring greater muscular exertion, is more peculiarly adapted for boys: yet, with slight modifications, may also be advantageously adopted by girls, in whom there is any decided evidence of in-

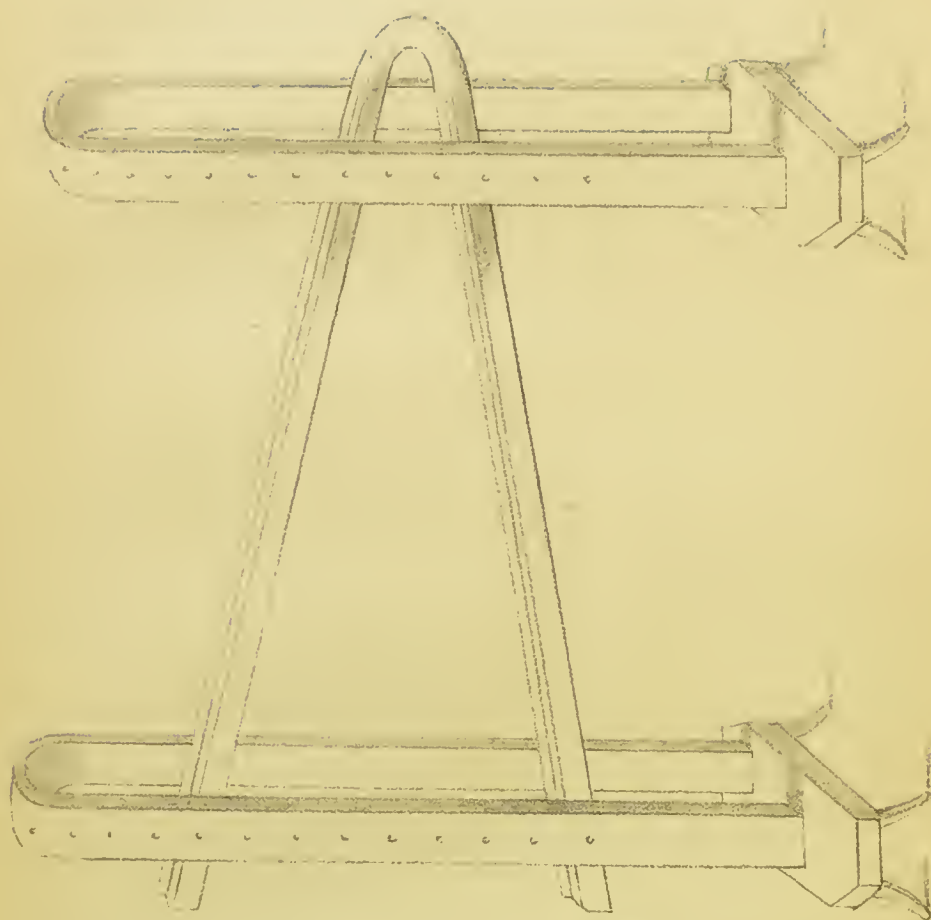
clination of the spine to either side. In such cases, the weight of the bells should be from one-fourth to one-third less than those employed in the manner first recommended.

Used in either of these manners, the dumb-bells are found a most efficient means of calling into salutary action all the muscles of the system. By their influence, the chest is gradually and equally expanded; the shoulder bones are properly depressed, and drawn towards the spine, and the symmetry of the back is otherwise improved in a remarkable manner.

At first, some difficulty and considerable bodily fatigue being experienced in using the dumb-bells according to the above rules, the exercise should not be persisted in longer than from one to two minutes at a time. After a lapse of eight or ten days, the period at each successive trial being increased, the exertion may be prolonged for ten or fifteen minutes, without being productive of any injurious fatigue*.

It is an exercise that should not be practised immediately after a meal; nor by children in whom the lungs are delicate, and who exhibit a marked tendency to consumption; because the organs devoted to breathing are thus actively called into play,

* When any obliquity of the spine already exists, experience has convinced me, that the utmost circumspection is requisite as regards the use of the dumb-bells, otherwise more harm than benefit may result.



and may in such cases be materially injured*. In schools, the discipline of the dumb-bells should always be conducted under the eye of the governess, when practicable, before breakfast in a morning, and in an evening, half an hour before going to bed,—the two most desirable periods of the day for the exercise.

Amongst exercises beneficial in their tendency may be enumerated Dodd's ball-exercise, the nature of which, and the mode of playing it, may be gathered from the annexed lithograph;—walking on a rope not elevated more than fifteen or twenty inches above the ground;—balancing such bodies of little weight, as a work-basket, pincushion, small bag of sand, and the like, upon the head;—or a rod in each hand alternately.

Under certain circumstances, a stand, similar to that of a child's rocking-horse, but of somewhat larger and stronger construction, with the extremities a good deal curved up, affords a very excellent and useful exercise. What I have suggested, and usually employ for this purpose, will be understood from the sketch delineated on the next page. In using it, the principal point to be attended to, is, not to swing the body, at each alternate movement, *on the feet* as a centre of motion; but to make it preserve its equilibrium, by *curving the spine in its whole length laterally upon itself, and upon the pelvis*

* The contrary is the popular opinion.

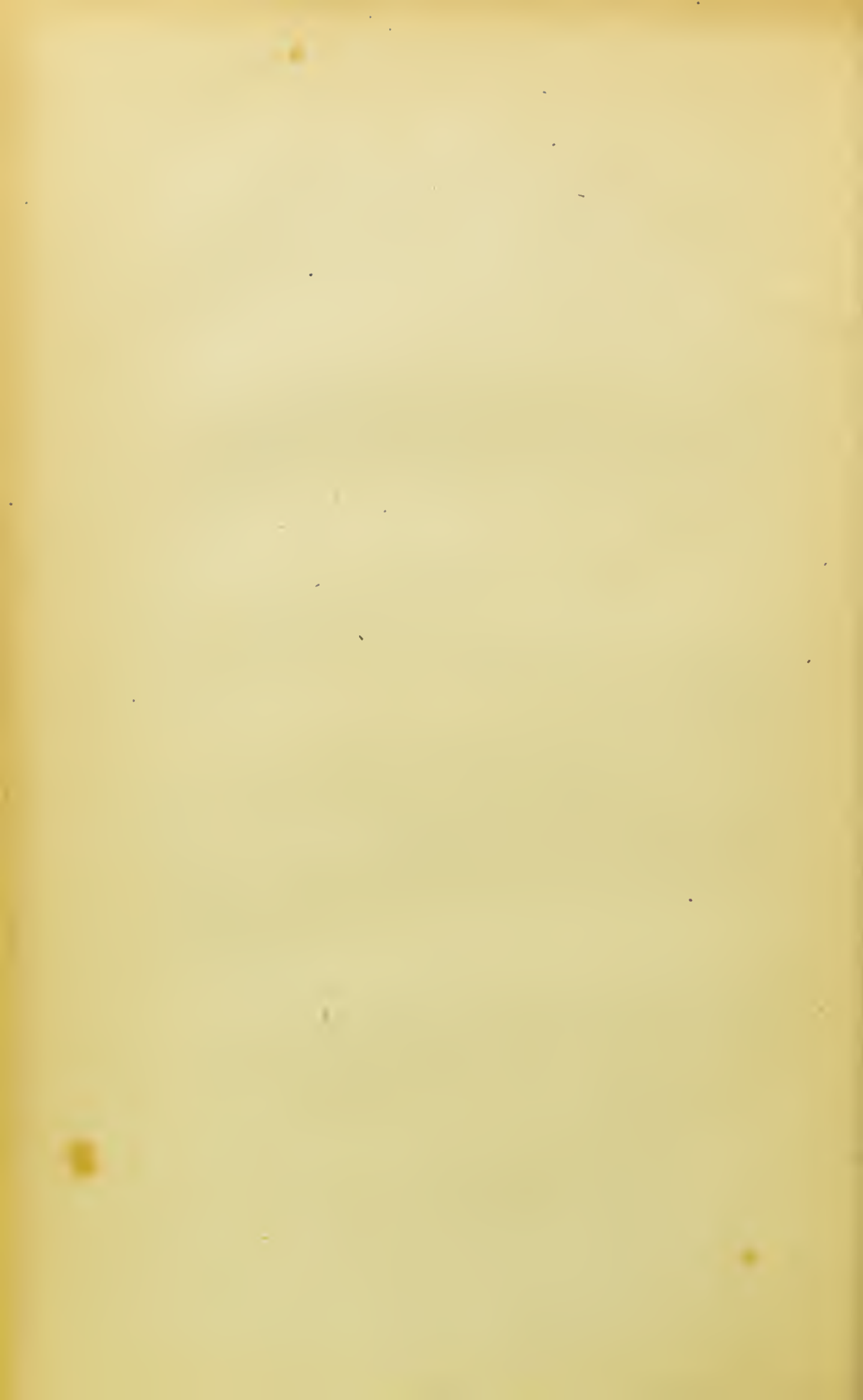
as a centre. The hips and knee joints ought to be held as fixed as possible ; the legs will consequently be straight, and their axis, under all positions of the rocker, at right angles with its floor. This is an exercise that demands some little practice to perform it properly ; and the girl should not wear corsets when engaged in it.

These, and similar pastimes being achievable only by symmetrical exertion of the muscles, at the same time that they tend to strengthen these organs, are calculated also to correct, as well as to prevent, any deviation from a gracefully erect form.

Nor should we omit to notice here the great advantages that may be derived from what has been denominated *passive exercise*, more especially in cases where a tendency to deformity has already manifested itself. Under the head of *passive exercises*, may be enumerated friction with the hand and with the flesh-brush, shampooing, and the like. A current of electricity also, directed along the course of the spine daily for the space of twenty minutes, or half an hour, or the warm douch bath, applied for the same length of time, often proves of incalculable utility in imparting a healthy and vigorous circulation to the muscles of the back, and thereby materially augments their power.



ROCKER EXERCISE PROPOSED BY THE AUTHOR.



SECTION VII.

It has been already remarked, that the *poising muscles, when over exerted, that is, when contracted beyond the usual or habitual period, become exhausted, and incapable of again obeying the dictates of the will, until such time as, during repose, they have received a new supply of nervous and vital energy.* It is in this manner that any constrained posture, by operating on certain of the muscles of the back and neck, produces the sensation of failing or sinking, generally urged by females as a plea for making use of artificial means of support. Young ladies at most seminaries are compelled to sit at all times erect, with the view of overcoming, or of preventing, the acquisition of the habit of stooping. However efficacious the exertion of the authority on the part of the governess, teacher, or schoolmistress, may prove in this respect, there is no doubt that an indiscriminate and rigid enforcement of this rule has often ruined the fondest hope of the parent. The observance of such a posture for several hours, in spite of fatigue, though aided by a *perpendicular backed chair*, must lay the foundation of a bad temper and of a crooked back. The very nature of this chair, the seat of which is too small, and the legs so long as not to allow the feet of the child to reach the ground, defeats the object it is intended to aid, — gives rise to fatiguing, debilitating action,

of the muscles of the back designed to support the body and head, and, by consequence, insidiously aids in giving too great power to the opposite set of muscles. All muscles, indeed, when enfeebled by exertion, require an interval for relaxation, in order that they may receive a new supply of energy; and are, during this interval, incapacitated for performing, with accuracy at least, their accustomed offices. If, then, the chair be still employed to aid the fatigued girl, other muscles, not adapted, except as occasional accessories, to keep the body in the erect position, are called into action, and thence the spine deviates from its natural direction, slightly at first, but finally to such an extent as to make it betray its want of symmetry, even to the most indifferent observer.

But these, and equally valid objections to the use of the straight-backed chair, are usually met by the assertion, "Sir Astley Cooper approves of it." The authority of so eminent an individual is doubtless entitled to the highest consideration. I venture to affirm, however, that Sir Astley does not sanction the employment of this chair for hours, without allowing the child, for the purpose of relaxation, to select a more easy attitude: yet, this is the practice pursued during school-hours at almost every seminary in town. The seat, moreover, of this chair is always made unnecessarily and injuriously small, and is placed at such a height as to deprive the body of the support which would be

imparted to it, by the feet being allowed to rest upon the ground, or upon a moveable frame attached to the legs of the chair, at any convenient point. In sitting upright, the knees should be more or less bent, and the feet ought to be supported. If the seat of the chair, from being too narrow, allow the thighs partially to hang down, they drag proportionately the lower part of the body; the fatiguing influence of which is experienced more particularly in the loins. There is at the same time a muscular effort to draw up the legs, in order to prevent their weight from dragging the person off the seat, which, combined with the constraint produced in the upper part of the body, by the effort to maintain the erect position, tends to twist the spine, and is an additional cause of deformity. But if the thighs be bent to a right angle on the body, and the legs be similarly inflected on the thighs at the knee joints, the feet being supported, then the base on which the body rests is square. In this case, each part supporting its own weight, no dragging nor fatiguing muscular action is induced; but perfect rest is obtained. On the contrary, when the legs hang down during a long-continued sitting, and the thighs have not a sufficient support, the latter are liable to become crooked. Hufeland asserts, that he has seen deformity of the limbs produced in children from this cause.

That muscles are absolutely exhausted, and temporarily deprived of their power by long-continued

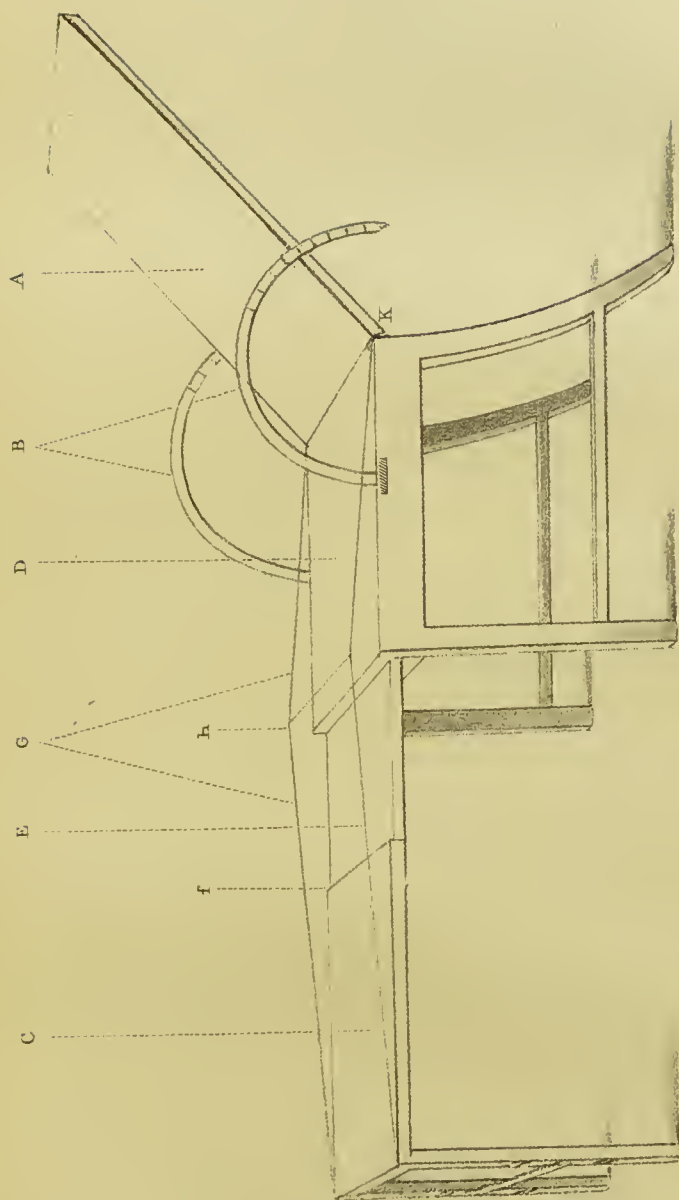
exertion, may be rendered apparent by a very simple experiment. Let any one extend his arm or leg in a given direction, say at right angles with the body, and endeavour to retain it in that position for the short space of five or ten minutes, and he will soon experience a highly painful sensation, accompanied by certain involuntary twitchings, or jerkings of the limb, in consequence of the muscles being more than ordinarily called into play. In spite of this striking evidence, girls, however delicate, are often compelled to retain the muscles of the back and neck, for hours together, in a state of undue action. The modern system of physical education demands such discipline; and most teachers being ignorant, unfortunately, of the principles upon which it can prove beneficial or the contrary, from zeal for the improvement of their pupils, carry it to excess. The variety in the physical powers of the children is not allowed to have its due weight: all are subjected equally to the same system. The stronger, perhaps, may be improved; but the weaker and more delicate girls must suffer, in proportion to their incapability of withstanding its influence.

That discipline of this nature is extremely fatiguing, and productive of great uneasiness both in the loins and in the upper part of the back, between the shoulders, is matter of experience, and of very just complaint with every young lady who has unfortunately been condemned to the *empirical* use of

this straight-backed chair. *A sitting posture, it should be remembered, does not necessarily relieve or give rest to the muscles supporting the head and body.* An unconstrained, easy, semi-recumbent, or perfectly supine position, can alone accomplish this desirable object. Whenever, therefore, the young person complains of being distressed, or wearied, by the erect position, she should immediately be allowed to adopt a reclining, or such other easy posture as nature may dictate. An unrelenting enforcement of the upright position, will, undoubtedly, defeat its own object, and expose its victim to the hazard of inveterate deformity.

Young ladies, instead of being compelled to make use of forms or perpendicular backed seats, during school-hours, with a view to the improvement of the person, should be allowed to sit on chairs made with a *reclining* back, stuffed tolerably hard with horse-hair. In cases of slight deformity, the back of the chair may be stuffed so as to fit the natural curves of the spine in the individual case, but it does not require to be formed with this accuracy when used as a means of prevention. Chairs of the above description, constructed somewhat upon the plan of that employed by the dentist, have long been used as easy chairs for elderly persons. By the aid of a hinge, the back takes any degree of inclination that may be thought desirable. But such chairs are somewhat expensive, and do not fulfil all the objects required in the cases we are considering. The chair

delineated in the lithograph is that which I usually recommend. Its construction is simple, and the cost trifling. The back *A*, it will be seen, is capable of taking any angle, and can be retained in reclination by means of the two iron semicircles, *B*, which are perforated by holes at the distance of about one inch each, through which an iron pin can be screwed. The part of the chair *C*, designed to support the legs of the individual, when more perfect supination is requisite, is so constructed as to slide under the seat, *D*, when not in use ; the middle portion, *E*, being hinged at *f*, so as to fall down behind at *K*, and thus occupy less room. The double-inclined plane *G*, extending from the back part of the seat to the extremity of the foot supporter, is capable of taking any angle at *h*, and can be retained there by means of desk brackets fixed underneath, so as to admit of the seat and back of the chair being always at right angles with each other—a point in the use of the chair that ought to be attended to. Without this precaution, when the back is much reclined, the body of the individual slides forwards by its own gravity, and renders the position not only uneasy, but injurious. When not required, the double-inclined plane, by being furnished with an additional hinge, may be made to fold up, and go upon the seat of the chair. The chair should be made low, reaching about the knee of the individual for whom it is designed ; or a foot-board, similar to that of a child's dining chair,



EDUCATION CHAIR, PROPOSED BY THE AUTHOR.

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may be attached to the legs of the frame, and raised, or lowered, at pleasure, in accordance with the height of the individual. The girl, when fatigued during school-hours, by the erect, may subsequently be allowed to assume the reclining posture*, without altering much the relative position of the parts of the spinal column, and thus she will relieve the muscles which poise the body, without, at the same time, hazarding the symmetry of the form, by allowing it to fall into an injurious or ungraceful attitude. When by such means rest has been obtained, the erect posture may be resumed. Similar alternations of exertion, and rest, may be made with advantage at intervals, during the day, without disturbing a proper and judicious course of mental cultivation. It is by no means necessary that the body should be placed in a *supine*, or *absolutely horizontal posture*, as some of the abettors of the inclined-plane-system of cure contend, for the purpose of relieving the spine of perpendicular weight. A very slight degree of reclination is sufficient for the purpose ;—of this any one may satisfy himself by a simple experiment. A piece of string, or any extremely flexible body, that cannot support its own perpen-

* It is quite a modern notion that the act of resting during the day in a recumbent posture, proceeds necessarily from indolence. We know that, amongst the ancients, a somewhat similar position was usually adopted during meals, probably from some reason founded on a knowledge of its beneficial tendency in the development of the form.

dicular weight in the slightest degree unaided, will remain perfectly straight, if laid against a card, piece of glass, or the like, that does not deviate more than five degrees from a right angle with the plane on which it stands. This position, moreover, is an useful one for many of the more common purposes of life—reading, sewing, &c. and neither fatigues the eyes so much in reading, nor presents so *outrée* an appearance, as that of lying extended on the back. At all events, in cases of slight curvature, it is quite adequate to fulfil every intention, and in many respects infinitely preferable to any other position. In aggravated cases, where the spine is so weak as to be totally unable to sustain its own entire weight, and that of the head also, still it is capable of some exertion for this purpose, and should be judiciously taxed in proportion to its powers. It is only by these means that it can acquire strength, and become fit to perform its own office. Even in an erect posture,—a position not only of importance, but absolutely requisite in the course of education,—we can easily relieve the spine of any portion of its duty we desire, by partially supporting the head. This may be effected by passing a soft strap under the chin, and along the occiput, and slipping the same through a pulley, fixed above the head. A weight equal to one-half or to two-thirds that of the head, attached to the strap, and allowed to hang down behind at a convenient distance from the body, will afford the requisite relief, and enable the girl

to pursue such studies as require her to sit in an erect posture.

The *inclined plane* has of late years been very much employed in fashionable seminaries for the purpose of *preventing* deformity, and recommended by the medical profession as a means of *cure*. But, in regard to its employment as a part of school-discipline, the principles, on which it can prove serviceable, are in general either not understood, or not attended to. I have been at some pains to ascertain this fact, as well as the comparative result of its employment as a means of prevention; and am satisfied that used, as it for the most part is, no good whatever is derived from its employment. In fact, what is ordinarily considered to be the use, is an abuse of the means. The girls are accustomed to lie extended on a broad, flat, inclined board, for a definite length of time every day, generally immediately after breakfast, whether fatigued or not; in fact, before they have had any opportunity of becoming fatigued. During the succeeding part of the day, they are subjected to the accustomed discipline, in the manner described in the foregoing pages. Such a practice, being a mere form, is necessarily unattended by the slightest advantage. Some of those even, who have employed the plane as a *mode of cure*, and who have therefore used it more sedulously, retaining the horizontal posture for months, almost without intermission, in accordance with the rules prescribed by

the introducers of the system, have informed me, that upon the plan being discontinued, the debility of the whole muscles of the body, consequent on the want of exercise, and the injury sustained by the general health, soon rendered the deformity fully as much, if not more, apparent, than it had formerly been. But in these instances, it is only justice to admit, that attention to *passive* exercise, (friction and similar modes of exciting the circulation,) had been neglected.

When used as a *preventive* of deformity, the plane is intended to afford a convenient and systematic mode of relieving exhaustion of the muscles of the back and neck, in delicate females, without obliging them to seek ease by throwing into contraction such as tend to produce an unseemly, or injurious position,—an end which it accomplishes in a very complete and effectual manner. To use it when rest is not required, is productive of little or no advantage.

Other contrivances adopted for the *prevention* of deformity are *back-boards*, *back-braces*, *collars*, and the *suspended weight*. On each of these it may be necessary to offer a few remarks. As the observations contained in Mr. Shaw's second series of Illustrations embrace all that need be said in explanation of the erroneous principle on which the application of these ordinary means is in general founded, no apology for availing myself of these sentiments is requisite.

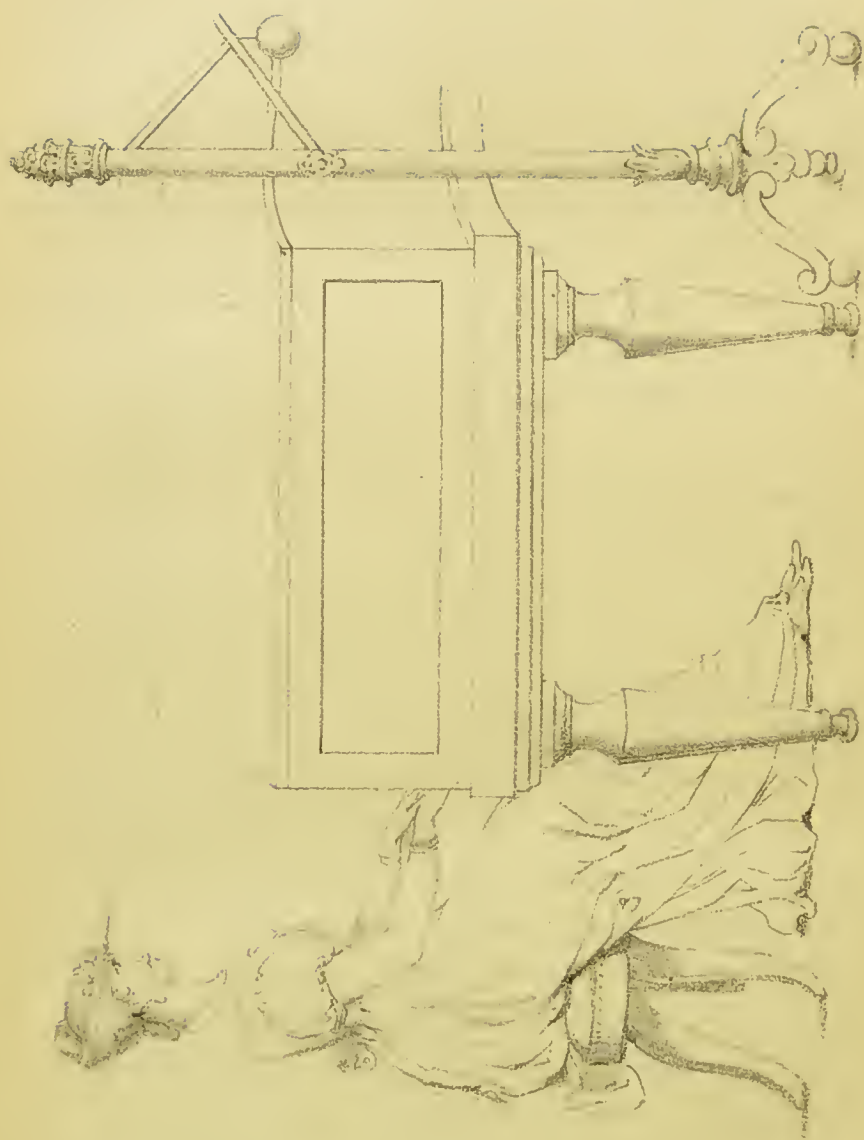
If the shoulders be braced by means of straps to a plate of iron placed on the back, it is evident that the action of the muscles, with which nature has endowed the body for the express purpose of holding the shoulders in a graceful position, will be superseded, and in accordance with the general law before enlarged upon, will, from want of due use, become proportionately incapable of performing their wonted office when the strap is removed. The muscles on the fore-part of the chest, whose actions are destined as an equalizing and antagonist power, will, from being excited to resist the force exerted by the straps, become increased in strength. When the use of the straps is discontinued, the shoulders will not only return to the position which they held previously to the application of the plate, but be further drawn forwards by the power gained by the muscles on the fore part of the chest, while opposing the action of the straps. *No constraining force, then, should be employed with a view to keep the shoulders back.* Machines of every description for the *prevention* of deformity, or for the cure of *bad habits*, should be avoided: they are at best very inefficient substitutes for the means provided by nature. In young persons, in whom we may wish to correct round shoulders, or a habit of stooping, we can obtain our object, and at the same time improve the general health and strength, more by a superintendence of their exercises and amusements, so as to make a moderate demand for mus-

cular exertion on particular parts of the body, than by the use of back-boards, collars, or any kind of mechanical contrivance. The dumb-bells, used in the manner described at page 62; the Spanish exercise,—one of the most beautiful of the Callisthenic;—skipping backward with the arms extended at full length; the game *La Grace*; that called *Le Diable boiteux**; double-handed shuttlecock; and many others might be suggested that are calculated to call these muscles into salutary action. When, however, the shoulders are very round, and the chest is remarkably narrow, a distorted state of the spine and ribs may exist, that would rather be increased than diminished by such exertions.

To correct the habit of stooping, it is customary to keep the head upright by means of a ribbon passed round the forehead, and fastened to the iron plate of a back-board, or attached to a weight allowed to drop down along the back. This apparatus, while worn, causes the figure to look straight, though stiff and constrained; but the moment it is removed, leaves the head and shoulders to fall more forwards than before its application. As long as the head is forcibly held back by this means, the muscles in the back part of the neck are in a comparatively quiescent or passive state, while those on the fore part of the neck are necessarily brought into a more than ordinary degree of action, in order

* *Anglicè*—Devil upon Two Sticks.





to prevent the head from being pulled too far back. If the ribbon by which the weight is suspended behind the back be suddenly cut through, without the knowledge of the wearer, the head is immediately nodded forwards; from whence we infer that the muscles on the fore part of the neck were those by which the head was enabled to support the weight, and that the muscles on the back part of the neck,—those in fault,—instead of acquiring power by the remedy employed, were in reality, from their action being superseded, deprived, to a certain extent, of that which they naturally possessed. When a weight is employed to correct stooping, it should be suspended in front of the body by means of a strap, passed round the back part of the head or neck. (*Vide Engraving.*) It will then call into play the muscles at the back part of the neck, and those between the shoulders. Thus, we observe that pedlars, and other persons who carry baskets or other weights before them, by means of a strap passed round the neck, are generally very upright, and broad-chested; but that persons, habituated to carry burdens on the back, which are in part supported by means of a band passed round the forehead,—as porters,—and the fish-women of Scotland, are round-shouldered, narrow-chested, and very much bent forwards.

In connexion with the present inquiry, it may be well to take into consideration the various punishments adopted in schools. Girls, as well from their

sex as from their natural delicacy, cannot be chastised in the same manner as boys. The infliction, however, of corporeal pain, though not expedient in seminaries for young ladies, is infinitely preferable to many of the modes of punishment common in these establishments. The practice of withholding food from children for several hours in succession until they have performed the allotted task, though highly reprehensible, is more or less resorted to in every school. The effect of this practice upon a child of delicate constitution, when carried to such an extent as to produce faintness from a want of the regular supply of the stimulus necessary to existence, proves highly detrimental to the physical powers ; and may, if frequently repeated, lay the foundation of tedious and exhausting disease. Confining a child during play-hours is also a chastisement which should be avoided. When, besides being starved and confined, the child is compelled to *stand* for several successive hours, until the task be accomplished, and to hold, perhaps, at the same time, at intervals, a book or other weight, sometimes a small dumb-bell*, in one hand, at arm's length, how can we expect that a delicate female, exposed to such a complication of causes calculated to produce distortion, can escape the evil? The indirectly injurious influence of the

* I know of two schools, wherein this very reprehensible kind of punishment was practised, and regarded as mild, because it was substituted for the infliction of corporeal pain.

stocks, that are used for turning out the toes, employed, as they often are, by way of punishment, is, in many instances, greater than commonly imagined; particularly if their use be rigorously persevered in for a length of time. I need do no more than hint at the lamentable effects, moral as well as physical, known to have been occasionally exerted on superstitious and timid children, by confining them alone in dark rooms*. The evil tendencies of the various injudicious modes of punishment, common in every seminary, afford a subject well deserving of consideration; but, it is one which, in detail, would be incompatible with the design of these observations. My intention, in alluding even cursorily to the subject, is to excite teachers to make a scientific inquiry into the probable effects of every part of school-discipline, in a moral and physical point of view†.

There are, moreover, many other customs not yet mentioned, calculated to impart a tendency to deformity of the spine. Some of these refer to a much earlier period of life than that which we have hitherto been considering: others do not apply to any particular age. The habit, which many nurses fall into, of always carrying the child upon the same arm, may

* I know of one instance, where the child was rendered an idiot for life by this very ill-advised practice.

† Some very excellent observations on punishments may be found in the first volume of "Practical Education," by Maria and R. L. Edgeworth.

give rise to deformity. The side of the child which is at liberty, being more exercised than the other, acquires a degree of development destructive of the natural equilibrium of the physical powers on each side of the body. This habit may also prove detrimental to the nurse, who may become "side-bent," or crooked, at the same time that her charge is suffering in the back and limbs. "English nursing," says the author of the 'Art of Beauty,' "in the sense in which it is usually understood, may be rightly interpreted, the art of deforming and weakening children by ill-directed care." Now, although we do not go so far in our invective as to admit this definition in its fullest extent, yet it merits notice. Nothing, for example, is more improper than to compel an infant, even for one moment, to sit in an *upright* position, without the *most perfect support being given to every part of the trunk, and more especially to the spine*. The head totters, and shakes about, like that of a palsied person, in consequence of the feebleness and instability of its support, and the spine bends in every possible direction. Yet nurses even, who pride themselves most on their practical knowledge, hesitate not to hold their charge in this unnatural position; and thus ignorantly, we can hardly add innocently, (for when told of their error, it is seldom that their consequence will yield to correction,) in not a few instances, lay the foundation of deformity. The shape may not, indeed, be always twisted, nor the back humped; but the gene-

ral growth may be stunted and dwarfed, and the evolution of the physical powers materially retarded. "Never prevent a child," says a late modern authority*, "from attempting to walk, however young it may be." But, in this respect, he carries his zeal for the encouragement of exercise to an untenable excess. There is no need to record examples of deformity, both of the back and limbs, produced in delicate children by this practice. They are familiar to every one. The rule of increasing strength by exercise is good in principle, but it must be understood within certain limitations ; else it may be readily abused. At a much later period of life even, the spine is unable of itself to support the head and other parts attached to it, and at the same time to retain the *erect* posture.

The injurious tendency of the errors in nursing, just noticed, though insisted on by many writers on the physical management of children, does not appear often to operate to the extent usually asserted. Deformity of the kind under consideration very rarely manifests itself before the child has attained the seventh or eighth year of age. From this period to the sixteenth, or eighteenth year, the highest degree of excitability of the nervous system exists. During this interval, the confinement of females, in the prosecution of their studies, is, perhaps, the greatest in proportion to their physical

* Dr. Davis's Oracle of Health.

capability. Constitutional disease, natural debility, and the acute complaints incidental to early life, are now most apt to proclaim themselves. The external agents, considered by far the most powerful in their injurious tendency, are now in the fullest degree of operation ;—and the bones of the spine, as we have seen, unduly retarded in their consolidation, by our pernicious school system, are urged by the greatest degree of weight.

The *effect* of another habit, or, more properly, of a luxury, noticed by most writers on the subject of early discipline, has been, in some degree, overrated. The habitual use of a feather bed, or of a soft mattress, it is maintained*, may materially influence the development of the form. Such a couch, by the luxury and comfort it affords, fosters a disposition to indolence ;—by the undue warmth it produces, enervates the system ; and by the position it imparts to the body, especially if the head be much raised, may favour the formation of spinal curvature, in children constitutionally predisposed to disease of the bones. The most desirable couch, during childhood, is a mattress stuffed with hair, bran, or dried moss. On this the body may enjoy refreshing and invigorating repose, without being rendered liable to the hazard of any of the evils just enumerated.

Children, who sleep two in one bed, contract a habit of always lying on the same side of the body ;

* Struve.



MALPOSITION IN BED.



which is calculated, in the predisposed, to favour the production of crooked spine. When the pillow is very high, and the bed soft, as is the case in feather and down beds, the attitude into which the body falls is very hurtful to the shape. The loins sink into the bed, the upper shoulder is pressed out of its natural place, the back becomes twisted, and the neck turned awry. A girl who is accustomed to lie in this malposition for years together every night, as is sometimes the case, can scarcely fail to have her figure injured. Instead of a soft bed, a hair mattress should be used, with rather a low pillow: and when children sleep together, they should be directed to change sides every night. Similar bad effects result from sitting much in one posture—a habit which persons are apt to fall into who sit always on the same side of the fire, or in the same direction with respect to the light. They are thus induced to lean to one side, and to retain the body in that position, until nature, by moulding the bones into new forms, renders them unable to recover their natural condition. From a knowledge of this fact, we are led to deprecate the practice, common in most schools, of assigning to each scholar a seat in a particular spot in the school-room. The seats should be common to all, and occupied by all in succession. To the practice, also, of compelling the class to stand, while the children are repeating the lesson of the day, may often be traced pernicious results. Boys, when obliged to stand during a

length of time for this purpose, are very apt to relieve the muscles that maintain the body erect, by balancing themselves on one leg, generally on the left*. Girls, from the confinement occasioned by their dress, being often prevented from bending the body, so as to balance it on one leg sufficiently to afford relief, attempt to maintain their equilibrium by passing the left hand round the back, and by drawing down the right elbow†. Although it is undoubtedly proper that a child should be allowed to vary her position at will when fatigued, yet, as formerly observed, she should not be permitted to habituate herself to the selection of an injurious or ungraceful attitude. To avoid the consequences we have been enumerating, the class may be allowed to sit whilst repeating the lesson, and each girl to rise in turn when repeating her part. The body, whilst in motion, can be maintained erect for hours at a time, without the person experiencing inconvenience. To stand upright and motionless, even

* In order more effectually to prevent the scholars from leaning, or standing crooked, by balancing the body on one leg, it is not unusual to make each one in the class, while repeating the lesson, hold a book on the head. Though suggested as an exercise, in a former part of this inquiry, it may be here requisite to observe, that it should never be resorted to while the attention is otherwise occupied, nor persisted in after the body is fatigued by standing. It is therefore improper under the circumstances just detailed.

† Shaw.

for the space of five minutes, is not only productive of great fatigue, but extremely wearisome.

Lastly, there is a temporary curvature of the spine, denominated *sympathetic*, which arises from certain states of the system, and which, by the unsuspecting or the ignorant, may be easily mistaken for actual distortion. Owing to such mistakes, girls have occasionally been confined for months to a horizontal posture, before the spine has been discovered to be only affected, *sympathetically*, by hysteria. The detection of the true nature of such a case is difficult, from hysteria being almost always a concomitant of that state into which the whole system is thrown, during the formation, or actual existence, of permanent obliquity of the spine, and is only to be accomplished by careful investigation on the part of the medical attendant.

The other varieties of Spinal Curvature (and there are several), that present themselves to notice, depend, for the most part, on some immediate organic or irremediable disorder of the bones, ligaments, or other structures of the vertebral column, and are, therefore, not exactly subjects calculated for the consideration or study of the general reader. They may be ranked among the most important of the numerous diseases to which the human body is liable, demanding an entirely surgical mode of treatment, and meriting the utmost professional care.

CONCLUSION.

Such, then, is a general, and, I trust, sufficiently intelligible, exposition of the manner in which certain agents, intimately connected with the system of education, at present so extensively adopted in this country, may prove prejudicial to health, or influential in the production of the most common variety of deformity of the spine.

Undeterred alike by the prejudices behind which many may entrench themselves, as by the philosophic indifference which many may assume, the author of these remarks has boldly, in some instances perhaps pragmatically, advanced his opinions. On this subject, with the man who is swayed by prejudice, or with the determined votary of fashion, who, when "truth meets the sight, and pointing shews the way," denies access to conviction, it were vain to expect success. The influence of fashion is such as to blind wilfully its votaries, ever ready to invent any excuse that may appear to sanction their adherence to a favourite custom. Such persons—though the pernicious tendency of what they defend may be self-evident—when argument fails them, repel with affected indignation every attempt to insist upon what they are predetermined not to believe. That the influence of the restraints, the fashions,

and the customs, pointed out in the foregoing pages, is really the principal cause of the deformity we have been considering, has ceased to be matter of doubt with those who have carefully investigated the subject.

Observation both of savage and of civilized life proves, that, the less the body is subjected to restraint during childhood, the more perfect does it become at a later period. In the *natural* state of man we meet with an inflexibility in the organization, which opposes an uniform resistance to those demonstrations of debility which are evinced by irregularity in structure. But *civilized* beings are remarkable for the facility with which they slide into deformity, and for the numerous instances they present of deviations from a regular standard. When, indeed, a child is allowed to grow up to manhood, as nature intends, neither badly nursed, stinted in food, limited in exercise, nor deprived of useful amusements; neither fettered by the restraints of dress, nor subjected to improper confinement, nor to any of the more injurious customs of civilized society; he will generally be found perfect and erect in form. In such an individual the back rarely becomes misshapen, unless from primary constitutional disease; by no means a necessary, but rather a rare concomitant of the defect we have been considering. The spine is found perfectly perpendicular, as regards its lateral aspect, and is liable to no distortion

but such as may result from accidental injury, or from long-continued and excessive labour. Such is said to be the condition of the form among savage nations, and such it is found to be among others, who, though not deemed savage by mankind, may, from the imperfect nature of their institutions, and from their total ignorance of the arts and sciences, fairly be called uncivilized. The peasantry of most countries are said to present this perfection of the person. In the East and West Indies, where the children of Europeans are not confined at an early period by dress, but permitted to indulge in such posture or exercise as the warmth of the climate may dictate, the *lateral* curvature, or *permanent inclination of the spine to one side*, is as completely unknown as among the native population.

The children of the British, brought up in warm climates, are generally much finer in form than their parents, and are free from spinal disease; though, from the tall slender figure which they assume, both in New Holland and America, they seem, as far as mechanical configuration goes, predisposed to these affections.

In ancient times, when so much attention was paid to the physical education of youth, the development of the frame must have been highly symmetrical; at least we should infer this to be the case from what we see sculptured on such fragments of ancient Grecian art as time and barbarism, united

to tyrannical oppression, have allowed us to snatch from the mouldering relics of the earliest votaries of science. In the present day, the system of education has undergone a material change; our institutions, habits, and customs, being widely different from those of ancient times. Physical strength is not so much regarded by the higher orders of society as an object of importance; mental energy alone claims every attention. They forget that, although a vigorous mind may sometimes dwell within a careworn rickety frame, it by no means always accompanies brawny magnitude, or florid health of body. Nothing tends so much to the due performance of all the mental operations, as a sound, a vigorous, a well-made frame. The mind has no actions, which it performs in a state dissevered from the body. At each distinct operation of its subtile labour, it exhausts a fixed and definite proportion of nervous energy, and cannot renew its labours beyond a certain limit, till the blood, rendered nutrient by food, renovates, in its course, the nerves whose power has been exhausted. Hence, exercise is not only useful in adding to the symmetry of the form, but also in lighting up and invigorating the spark by which that form is animated and beautified.

Let not those who do not, after what has been said, satisfactorily understand the subject, neglect, on that account, the arguments here advanced, or regard the conclusions drawn from them as devoid

of foundation. Some men are ever prone to disbelieve what they cannot comprehend, or to cavil at what they are unwilling to credit. Others, from a propensity to attribute every ordinary and natural effect to some extraordinary and unnatural cause, mistake the unintelligible for the wonderful, and refuse that confidence in the simple resources of nature which they repose in the miraculous pretensions of empiricism. Nor is it the least curious feature in this "medical superstition" that it often involves in its trammels, persons, who on every other occasion would resent with indignation any attempt to talk them out of their reason, still more so to persuade them out of their senses. Though the cultivation of the mind be, undoubtedly, an object of the highest importance, yet we should not forget, that man has a body ; or that, however the language of Stoic philosophy may designate the earthly tenement of the soul a clog, a hovel, or a prison,—the mind a flower, a jewel, or a treasure,—in the human individual, composed as he is of both body and mind, each of these respectively demands his care. I should, indeed, like to see the argument of the moralist, who would undertake to contend that he has a right to neglect the cultivation of either. The pedant may affect to disregard the trifling evil, *spinal deformity*, as he affects to disregard every other physical infirmity ; the Cynic may sneer at personal symmetry, as he sneers at all other human excel-

lence ; but I know of no principle that authorizes a wanton neglect of, or deviation from, the standard of physical perfection. Nor is the question so trifling in importance as the cultivators of mental accomplishment only may be disposed to imagine. There would, perhaps, be less vanity in the world, were there less physical inequality. In every instance, moreover, in which we avert deformity, we stop at least one fruitful source of mental inquietude, or even of bodily suffering. It would afford room for much interesting speculation, were we to trace the mysterious connexion that exists between corporeal and mental defects ; to inquire into the causes of the harshness of a Johnson, or the melancholy of a Pascal. But there is one consideration, which the prudent parent will do well not to overlook. If there be a good quality, which, more than all others, conduces to comfort and happiness, it is—good temper. Deformity is almost always irritable and ill-tempered. With many, indeed, trials of this nature have been attended with the happiest effects,—have exercised patience, and strengthened fortitude. The parent does not, however, thence derive any right to expose his offspring to such trials. By cultivating those blessings which Providence in his bounty may bestow,—the beauty and fragrance of the flower, as well as the richness and flavour of the fruit,—he will shield himself from the mortification of beholding the most brilliant endow-

ments paralysed by the baneful influence of trivial defects, and secure for himself the enjoyment of that which far surpasses all the triumphs of the ball-room, all the exhibitions of the study—*the domestic happiness of his child.*

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THE END.



